DRAFT REPORT

2018 GAY MINE REMEDIAL INVESTIGATION DATA SUMMARY REPORT

Gay Mine Remedial Investigation
Fort Hall, Idaho

Submitted to:

US EPA

Region 10
1200 Sixth Avenue (ECL-115)
Seattle, WA 98101

Submitted on behalf of:

FMC Corporation
2929 Walnut Street
Philadelphia, PA 19104

J.R. Simplot Company:
1150 W. Highway 30
P.O. Box 912
Pocatello, ID 83204

Submitted by:

Golder Associates Inc.

18300 NE Union Hill Road, Suite 200 Redmond, Washington, USA 98052

+1 425 883-0777

103-93418-16.003.700

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Distribution List

Joe Wallace, USEPA

Jeff Hamilton, J.R. Simplot Company

Alan Prouty, J.R. Simplot Company

Lori Hamann, J.R. Simplot Company

Dave Heineck, Summit Law Group

Jonathan Bucca, FMC

Sandi Fisher, USFWS

Kelly Wright, SBT

Susan Hanson, SBT

Randy Thompson, BIA

Colleen S. O'Hara, BLM

Julius Nwosu, USEPA

Ted Repasky, USEPA

Nick Vidargas, USEPA

Joe Goulet, USEPA

Kay Morrison, USEPA

Nikki Carlton, CH2M

Jeff Schut, CH2M

Jeremy Moore, USFWS

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ACRONYMS AND ABBREVIATIONS

ALS	ALS Environmental Laboratory
amsl	above mean sea level
ASA	Administrative Settlement Agreement and Order on Consent
bgs	below ground surface
cfs	cubic feet per second
COPC	contaminant of potential concern
DSR	Data Summary Report
EPA	United States Environmental Protection Agency
ESL	ecological screening level
Golder	Golder Associates, Inc.
gpm	gallons per minute
HHSL	human health screening level
ISM	Incremental sampling methodology
LC_{50}	lethal concentration for half the test organisms
MCL	maximum contaminant level
mg/L	milligrams per liter
MS/MSD	matrix spike/matrix spike duplicate
NTU	nephelometric turbidity unit
pci/l	picocuries per liter
QAPP	Quality Assurance Project Plan
QC	Quality Control
RI	Remedial Investigation
RI/FS	Remedial Investigation and Feasibility Study
RIWP	Remedial Investigation Work Plan
S40	South 40
Site	Gay Mine Site
SOW	Scope of Work
SPNL	Southern Portion of the North Limb
s.u.	standard unit
TDS	total dissolved solids
TKN	total kjeldahl nitrogen
TOC	total organic carbon
Tribes	Shoshone-Bannock Tribes
TSS	total suspended solids
µg/L	microgram per liter
µS/cm	microSiemens per centimeter
USGS	United States Geological Survey

1.0 INTRODUCTION

This Data Summary Report (DSR) has been prepared by Golder Associates Inc. (Golder) on behalf of the J.R. Simplot Company and FMC Corporation ("The Companies"). The report has been prepared in accordance with the requirements of the Administrative Settlement Agreement and Order on Consent (ASA) Scope of Work (SOW) for Performance of a Remedial Investigation and Feasibility Study (RI/FS) for the Gay Mine Site (Site) in southeastern Idaho.

1.1 Purpose and Scope

The purpose of this DSR is to describe field activities and present results for Remedial Investigation (RI) work completed during 2018 at the Gay Mine (Figure 1.1-1). Field investigations conducted during 2018 consisted of installation of groundwater monitoring wells in the East Limb of the Site and surface water and groundwater sampling per the 2018 RI Work Plan (RIWP) addendum (Golder 2018).

An RIWP was prepared by Golder and describes the overall RI work to be performed at the Gay Mine (Golder 2014). This was implemented in phases according to approved RIWP Addenda, summarized below:

- Reconnaissance activities were performed in the fall of 2014 and used to revise the Site investigation plan as reported in the 2014 DSR (Golder 2015a). Survey work included a search for potential hazardous materials in the Headquarters Area for further investigation, general surveys of mapped overburden and mill shale piles, a geologic survey across the Site, a survey of historic groundwater wells, and mapping vegetation types across the Site.
- During 2015, the first phase of Site investigations was completed according to the 2015 RIWP Addendum (Golder 2015b). Results were presented in the 2015 DSR (Golder 2016a). This work included a geophysical survey of underground utilities and sampling of potentially hazardous materials in the Headquarters Area, sampling of surface water in the fall, sediment sampling, riparian soils collections, shallow groundwater well installation and sampling in the South 40 area, and incremental sampling methodology (ISM) and discrete soils and vegetation collection (dominant plants and selenium accumulators) from 5-acre overburden decision units, mill shale piles, the landfarm area, background areas, and haul roads.
- A 2016 RIWP Addendum (Golder 2016b) was prepared and the original Quality Assurance Project Plan (QAPP; Golder 2015c) was updated to reflect work in both the RIWP and the 2016 RIWP Addendum as a revised QAPP (Golder 2016c). The 2016 RIWP Addendum presents the details of the groundwater investigation in the South 40 and Southern Portion of the North Limb (SPNL) in the old Headquarters Area. One of the deep aquifer wells in the South 40 (MW-S40-3) described in the 2016 RIWP Addendum was installed and sampled during 2016, with results presented in the 2016 DSR (Golder 2017a). Additional 5-acre overburden ISM soil sampling was performed across the Site, as well as collections of dominant vegetation, riparian vegetation, selenium-accumulator vegetation, and culturally-important vegetation. Mud nest materials were collected to address avian exposures. Spring surface water was collected across the Site. All data were presented in the 2016 DSR (Golder 2017a).
- The remaining wells in the South 40 and SPNL (near the Headquarters Area) proposed in the 2016 RIWP Addendum were installed during 2017 per the 2016 RIWP Addendum (Golder 2016b) and described in the 2017 DSR (Golder 2018a). The additional sampling of culturally-significant plants in the background areas

was detailed in a memo submitted to the United States Environmental Protection Agency (EPA), the Shoshone-Bannock Tribes (Tribes), and other agencies (Golder 2017b).

- The 2018 Gay Mine Groundwater and Surface Water RIWP Addendum summarizes the field activities conducted during 2018 (Golder 2018b) for groundwater well installations in the East Limb as well as spring and fall surface water sampling across the Site.

A summary of contaminants of potential concern (COPCs) for all environmental media sampled at Gay Mine in 2018 as listed in the QAPP (Golder 2016c) is provided in Table 1.1-1. The EPA provided approval via email communications (Wallace 2018) for the groundwater monitoring well and surface water investigations per the submitted RIWP Addendum (Golder 2018b). All analytical work was performed by ALS Environmental Laboratories (ALS).

1.2 Report Organization

This DSR includes the following sections:

- Section 1.0 – presents the purpose of this report.
- Section 2.0 – presents a description of the field work performed during 2018.
- Section 3.0 – presents a summary of the results of the field work completed during 2018.
- Section 4.0 – presents a summary of data requirements based on the results of the field work to include in a RIWP Addendum for work to be implemented during 2019.
- Section 5.0 – provides references cited in the report.

2.0 DESCRIPTION OF FIELD WORK COMPLETED DURING 2018

2.1 Surface Water Investigations

Two surface water sampling events were conducted in 2018 as part of the RI investigations with the objective to collect additional data to verify concentrations of COPCs in surface water during normal spring (high-flow, spring snowmelt) and fall (low-flow) hydrological conditions.

2.1.1 Surface Water Sampling Locations and Procedures

Surface water samples were collected from May 15 through May 23, 2018 to target high-flow conditions and from September 10 through 21, 2018 for low-flow conditions at the sites identified in the 2018 RIWP Addendum (Table 2.1-1; Golder 2018). A total of 46 sites were sampled during the May 2018 effort, including collection of 3 duplicates and 3 blanks. All sample locations were the same as in 2016 except for of Sites SW-008, SW-036, and SW-049. Site SW-008 was sampled approximately 300 feet downgradient of the 2016 sample location due to the higher amount of water in the area (a GPS point was collected at the sample location). Water was not observed at SW-036 at the location of the 2016 sample, however ponded water was observed about 200 feet west of the 2016 SW-036 location. A composite sample from the four quadrants of the pond was collected as SW-036 and new GPS coordinates were taken of the pond and sample location. Site SW-049 was a new site added on Lincoln Creek, upstream of Site SW-001. During the September 2018 event, all sites were revisited and a total of 36 sites had water and were sampled, with 2 duplicates and 2 blanks collected.

Figure 2.1-1 shows the surface water sample locations. All sampling efforts including daily calibration of field equipment were documented in a field notebook, presented in Appendix A. Photographs were taken at each site in the spring and fall and are presented in Appendix B.

Surface water samples were collected using two different methods dependent on type of water body, as outlined in the QAPP (Golder 2015c). For flowing water, a peristaltic pump was used. Tubing and filters were used to collect a sampled from one location and then disposed as non-hazardous waste. For pit lake and pond sites, disposable Nalgene™ containers provided by the analytical laboratory were used to collect four subsamples of surface water from four quadrants of the water body. This sample was mixed in the Nalgene™ bottle and then the peristaltic pump was used to fill sample bottles.

No decontamination was required as all sampling materials used were disposable and only used for one sampling event. A field blank for unfiltered samples and an equipment blank for filtered samples were collected for surface water samples to represent field conditions and to establish if the dedicated equipment contributed any contamination. These blanks were collected at a frequency of 1 in 20 as described in Section 2.5 of the QAPP (Golder 2015c).

2.1.2 Opportunistic Wildlife Observations During Surface Water Sampling

Animals observed during water sampling include the following species:

- Red Tail Hawk (*Buteo jamaicensis*)
- Coyote (*Canis latrans*)
- Mule deer (*Odocoileus hemionus*)
- Rocky Mountain Elk (*Cervus canadensis nelsoni*)

- Salamander (*Ambystoma tigrinum*)
- Swallow, likely cliff swallow (*Petrochelidon pyrrhonota*)
- Unidentified bird species including water fowl, song birds, and grouse
- Small unidentified fish
- Unidentified frog
- Unidentified snake
- Unidentified swimming rodent

In addition, cattle and signs of cattle were observed at many of the locations in both the spring and fall sampling events.

2.1.3 Livestock Investigations

Danielle Gunn of the University of Idaho, Agricultural Extension Educator (Fort Hall, ID) examined two cows as part of the Livestock Investigation Protocol (Golder 2017c). The first was a dead calf in the Headquarters Area on September 19. She determined that this calf was most likely hit by a vehicle due to bruising in the chest cavity, and there was no external evidence of selenium toxicity (Gunn 2018a). Samples of liver tissue and rumen contents were shipped to the Poisonous Plant Laboratory for analysis. The necropsy results were provided in an email by Ms. Gunn on October 23, 2018 (Gunn 2018c). Dr. Jeff Hall wrote the necropsy summary for the Poisonous Plant Lab which found that most of the mineral concentrations in the bovine liver sample were in the expected normal range except for lower than normal copper and selenium which was higher than the threshold for clinical signs of chronic selenosis, but well below the threshold for acute effects. This report is included in Appendix E for reference. The other cow investigated was a potentially blind calf that she examined in the afternoon of October 4, 2018. She determined that the calf had limited eyesight and was suffering from some sort of viral infection not related to Gay Mine metals or poisonous plants (Gunn 2018b).

2.1.4 Surface Water Flow Measurements

Surface water flow measurements were collected at Sites SW-018, 019, 020, 021, 023, 024A, 031, 034, and 049 during both events. Channel geometry and flow velocities were measured in the field to calculate estimated flow rates. These measurements were recorded in the field forms and in the field notebooks (Appendix A). With the exception of SW-034, the flows measured in May were higher than the September measurements. Sites SW-018, 019, 020, and 049 (on Ross Fork, Big Spring, and Lincoln Creek) had the highest flows for both events, measuring 17.3 to 41.1 cubic feet per second (cfs) in May and 6.5 to 30.5 cfs in September. The lowest flows in May were measured at Sites SW-021, 031, and 034 (Jeff Cabin Creek, Portneuf River, and Bakers Creek) at 2.3 to 4.6 cfs. The lowest flows measured in September were at Sites SW-021, 024A, and 031(Jeff Cabin Creek, Portneuf River, and Bakers Creek) between 1.05 to 2.96 cfs. SW-034 had a measured flow of 2.7 cfs in May and 3.8 cfs in September, indicating a slight increase in flow from the May to September event. Flow measurements are listed in Table 3.1-4.

2.2 Well Drilling and Installations

The groundwater investigations at the Site are being conducted using a phased approach. Phases 1 and 2 of groundwater investigations in the South 40 Area and Phase 1 in the SPNL Area were completed between 2015 and 2017. The 2018 drilling program consisted of a Phase I groundwater investigation of the East Limb Area.

The purpose was to characterize occurrence, flow direction, and water quality of the Wells Formation regional groundwater system. The objective was to advance and install three monitoring wells in the Wells Formation in the East Limb Area, as described below. Also, in 2018, water quality samples were collected from the existing Wells Formation monitoring wells in the South 40 and SPNL areas (Section 3.2).

The well drilling and construction in 2018 generally followed a similar methodology as used between 2015 and 2017. The wells were drilled and installed by Thomas Drilling, Inc. (Afton, Wyoming) using a Schramm Fury 120 air-rotary drill rig. A Golder field geologist was onsite to provide oversight and direction. The boreholes were logged by a Golder geologist by inspecting drill cuttings, monitoring drill action, and communicating with the driller.

Two of the three borings were completed as monitoring wells MW-EL-02 and MW-EL-03. Boring EL-01 was terminated at 445 feet in the Dinwoody Formation. No well was installed in this boring, as detailed in Section 2.2-2. Monitoring wells MW-EL-02 and MW-EL-03 were constructed in accordance with Shoshone-Bannock Tribal Water Resources well construction regulations (Shoshone-Bannock 2013). MW-EL-02 was constructed entirely with 4-inch diameter stainless steel casing due to the relative shallow static water level in this well (approximately 70 feet below ground surface [bgs]). MW-EL-03 was constructed with 4-inch diameter carbon steel casing from the ground surface to 165 feet bgs (within approximately 140 feet of the static water table) and stainless steel casing and screen was used below this depth to protect the integrity of the water quality samples. A 20-slot interval (0.020 inch) was used for the well screens and the gravel pack was Colorado 10x20 silica sand in both wells. The wells were sealed using bentonite and cement grout.

The well locations are shown on Figure 2.2-1. Well completion details are provided in Table 2.2-1. Detailed well logs and well construction diagrams for the two wells completed in 2018 are included Appendix C. The drilling and well completion details at individual wells are provided below.

2.2.1 Summary of Geologic Conditions

The geologic conditions of East Limb Area consist of a complex assemblage of sedimentary formations found elsewhere on the Gay Mine Site. Previous site investigations (Corbett 1980) and existing geologic maps (Mansfield 1927) indicate the following formations (from youngest to oldest these formations) may be present in the East Limb: recent alluvium and aeolian deposits, Salt Lake Formation (mixed deposits), Thaynes Formation limestone, Dinwoody Formation shale and mudstone, Phosphoria Formation (primarily) shale, and Wells Formation (primarily) limestone. The phosphate ore that was mined during operations was found in the Meade Peak member of the Phosphoria Formation. There are no overturned beds in the East Limb Area, meaning the Wells Formation underlies the Phosphoria Formation throughout the area.

The two primary geologic structures in the East Limb Area are the Central Gay Mine fault that runs southeast to northwest along the northern portion of the East Limb Area and a north-northwest trending syncline on the east side of the East Limb Area. The Central Gay Mine fault is a tear fault that runs through most of the Gay Mine Site and, in the East Limb Area, may form an impermeable barrier between the East Limb and the Gay Mine syncline to the north (Corbett 1980). The East Limb geology is shown on Figure 2.2-2 using a regional geologic map developed by the United States Geological Survey (USGS). As noted below, the 2018 groundwater investigation identified localized inaccuracies in the USGS geologic map (in the vicinity of borehole EL-01) but it is included in this report to illustrate the general geologic conditions of the area.

There are a series of northwest trending normal faults in the area, which may control the outcrops of Phosphoria Formation in the East Limb. The mining activity was focused in areas with outcropping Phosphoria Formation (Figure 2.2-2). The USGS map shows the Wells Formation exposed at ground surface in small areas adjacent to the Phosphoria formation outcrops. The Phosphoria Formation is surrounded to the west and east by the younger Dinwoody and Thaynes Formations.

The geologic conditions encountered in each borehole are summarized below and detailed on the well logs (Appendix C). Well locations are shown on Figure 2.2-1. The geologic conditions vary between the borehole locations with the EL-01 and EL-03 boreholes intersecting younger geologic formations. The EL-02 borehole intersected Wells Formation bedrock near ground surface because the drill location was in the bottom of the former U Pit. Monitoring wells MW-EL-02 and MW-EL-03 were completed in Wells Formation bedrock. The Wells Formation is a mix of sandstone, siltstone dolomite, and limestone beds ranging from very hard to loose/fractured. Groundwater was typically found in loose or fractured zones. No monitoring well was completed in the EL-01 borehole. Details for each boring are provided below.

- **EL-01**: Boring EL-01 was drilled within overburden to the east of the BB and II pits within the toe of the external overburden disposal area, approximately 1,500 feet east of II-2 Pit. The geologic conditions encountered during drilling consisted of approximately 25 feet of unconsolidated overburden material followed by semi-consolidated to consolidated siltstone and shale. The borehole was drilled to a depth of 445 feet bgs. The entire sequence encountered during drilling (except for the upper unconsolidated overburden) was interpreted to be part of the Dinwoody Formation. Groundwater in borehole EL-01 was initially intersected between approximately 60 and 65 feet bgs, occurring in a zone of predominantly fractured shale. Additional water bearing zones in the Dinwoody Formation were encountered as drilling continued to 445 feet bgs (see Section 2.2.2). The geologic conditions encountered during drilling differed from the regional geologic maps, which showed Phosphoria Formation at ground surface. Geologic interpretation of the drill cuttings during drilling suggested that the Dinwoody Formation in the vicinity of borehole EL-01 could approach a thickness of 800 to 1,000 feet. This is supported by Corbet (1980), which stated that the Dinwoody Formation can be up to 1,100 feet thick in some locations, with up to 500 feet of Phosphoria Formation below the Dinwoody Formation and above the upper unit of the Wells Formation. Based on the apparent steeply dipping (possibly in the range of 30°) strata in the area of borehole EL-01, the potential depth to reach the Wells Formation was estimated at 1,500 feet. Because the potential depth of the well far exceeded the planned depth, it was not feasible to install a monitoring well in the Wells Formation at this location and the boring was terminated at 445 feet bgs (Golder 2018c).

- **MW-EL-02**: MW-EL-02 was drilled in the bottom of the U-3 Pit, which is located on the north side of the East Limb. The upper 45 to 50 feet of the MW-EL-02 borehole was unconsolidated material or broken rock, potentially overburden material associated with the U-3 Pit. The borehole intersected competent Wells Formation bedrock at 50 feet bgs with layers of sandstone, limestone, and dolomite. A water bearing zone was encountered at approximately 100 to 105 feet bgs during drilling and the borehole was terminated at a depth of 125 feet bgs. Static groundwater recovered to approximately 75 feet bgs.

- **MW-EL-03**: MW-EL-03 was drilled approximately 1,200 feet west of the HH pits on unmined ground. Consolidated bedrock was encountered at approximately 10 feet bgs and consisted of shale, limestone, and siltstone with some sandstone, interpreted to be part of the Dinwoody Formation. The Phosphoria Formation was encountered at approximately 222 feet bgs, interpreted by Corbett (1980) to be the Cherty Shale member of the Phosphoria formation. The Meade Peake member of the Phosphoria formation was intersected at approximately 325 feet bgs and continued until approximately 590 feet bgs. Groundwater was encountered in the Cherty Shale but not the Meade Peak (Section 2.2.2). Wells Formation bedrock began at approximately 595 feet bgs and continued until the boring was terminated at 636 feet bgs. Wells Formation groundwater was encountered at the top of the formation and static water level was measured at approximately 310 feet bgs following well completion. Groundwater was also encountered in the Dinwoody Formation during drilling (Section 2.2.2).

2.2.2 Summary of Hydrogeologic Conditions

Groundwater was encountered in the Dinwoody Formation, the Cherty Shale member of the Phosphoria Formation, and the Wells Formation during the 2018 East Limb Groundwater investigations. Groundwater in the Dinwoody Formation and Cherty Shale are likely part of groundwater flow systems that are isolated from the Wells Formation regional groundwater system. No groundwater was encountered in the Meade Peake member of the Phosphoria Formation (i.e., lower portion of the Phosphoria Formation), indicating low-permeability material that acts as a groundwater flow barrier, as has previously observed (e.g., Corbet 1980). Two monitoring wells were completed in the Wells Formation (MW-EL-02 and MW-EL-03). Borehole EL-01 was abandoned in accordance with tribal well abandonment procedures because the geologic conditions encountered during drilling indicated that it was not feasible to install a well at the location of borehole EL-01 in accordance with the objectives of the study plan (Section 2.2.1). The hydrogeologic conditions encountered in each borehole/monitoring well are summarized below.

- **Borehole EL-01**: Groundwater was encountered in the Dinwoody Formation at a depth of approximately 60 feet bgs. Additional discrete water bearing zones within the Dinwoody Formation were intersected at depths of approximately 125 feet bgs, 170 feet bgs, 275 feet bgs, and 330 feet bgs and these zones occurred in areas of weaker or fractured rock. Water production rates (i.e., the rate of borehole discharge from the air-rotary drilling system) was estimated at over 300 gallons per minute (gpm) at the end of drilling, although production rates decreased during drilling in areas with more competent rock. Static water levels, which were measured inside the cased borehole during and after drilling, remained between approximately 50 and 55 feet bgs. The final static water level was 54 feet bgs, which was collected after the borehole was advanced to total depth (445 feet bgs) and the casing was pulled up several feet to prevent plugging. A static water level of 54 feet bgs translates to a groundwater elevation of approximately 5,880 feet. The relatively consistent static groundwater levels, along with existing information of the hydrogeologic properties of the Dinwoody Formation (e.g., Corbet 1980), indicate that groundwater encountered throughout borehole EL-01 is a continuous, hydraulically connected groundwater system with variable permeability. Groundwater levels during drilling only varied slightly. This indicates that vertical gradients within the Dinwoody Formation at this location are low and there is good hydraulic connection between vertical intervals within the Dinwoody Formation. The hydraulic connection between vertical intervals is facilitated primarily by fracture zones.

- **Monitoring Well MW-EL-02:** As discussed above, Wells Formation bedrock was intersected near the top of MW-EL-02 and was the only bedrock encountered during the drilling of this well. Groundwater was first encountered at approximately 100 feet bgs and drilling was terminated at 125 feet bgs. The well was completed with a screened interval from 90 to 120 feet bgs. The static groundwater level after well development was approximately 77 feet bgs or 5,738 feet elevation, as determined from well survey data collected after the well was installed.

- **Monitoring Well MW-EL-03:** During the drilling of MW-EL-03, groundwater was encountered in the Dinwoody Formation, the Cherty Shale member of the Phosphoria Formation, and the Wells Formation. Little to no groundwater was encountered in the Meade Peake member of the Phosphoria Formation. Groundwater in the Dinwoody Formation was first encountered at approximately 60 feet bgs and production rates increased slightly at approximately 150 feet bgs but production rates were 0.5 gpm or less throughout the Dinwoody Formation. The water level in the Dinwoody Formation was approximately 60 feet bgs, or approximately 6,000 feet elevation. Groundwater was encountered near the top of the Cherty Shale, at approximately 230 feet bgs. The production rate was less than 2 gpm but increased to approximately 30 gpm at 310 feet bgs. During drilling, a grout plug was set at the base of the Phosphoria Formation to isolate upper groundwater systems from the Wells Formation groundwater, and the monitoring well was sealed at the top of the Wells Formation to seal off the overlying groundwater. The top of the Wells Formation was intersected at approximately 596 feet bgs and groundwater was encountered near the top of the formation. The borehole was drilled to a total depth of 636 feet bgs and the well was screened from 610 to 630 feet bgs. The static groundwater level after well development was approximately 311 feet bgs or 5,750 feet elevation, as determined from well survey data collected after the well was installed.

2.2.2.1 Wells Formation Groundwater

The Wells Formation static groundwater elevations in MW-EL-02 and MW-EL-03 were approximately 5,738 feet and 5,750 feet, respectively, following well development. Figure 2.2-3 compares these groundwater elevations to those measured in the W Pit (5,742 feet) and Z Pit (5,738 feet) in September 2018. Previous studies have suggested that the Wells Formation groundwater discharges at the bottom of the pits and is a primary source of water in these pit lakes (Corbet 1980). The W Pit elevation provides a third point with MW-EL-02 and MW-EL-03 to triangulate the flow direction in the Wells Formation, which suggests northeasterly flow in the East Limb Area towards the Central Gay Mine fault.

The Z Pit water elevation was approximately 4 feet lower than the W Pit in September 2018. Water level sensors (i.e., pressure transducers) were installed in the W and Z Pits in June 2016. The sensor data were converted to water elevations from survey data collected in 2018 and are shown on Figure 2.2-4. The figure shows that changes in water elevations in the W and Z Pits follow a similar pattern, suggesting a common hydrogeologic source between the pit lakes. The Z Pit water elevations have been consistently lower than the W Pit elevations. Over the period of transducer record (June 2016 through July 2018), the average elevation of the W Pit was 5,739.04 feet compared to 5,735.09 feet in the Z Pit. Over this period, water levels in W Pit were 2.6 to 5.2 feet higher than the Z Pit. The lower elevation of the Z Pit, when compared to the W Pit and the East Limb Wells Formation monitoring wells, indicates there is a potential hydrologic divide or barrier between the Z Pit and the W Pit.

A total of six monitoring wells (three in each area) were completed in the Wells Formation in the South 40 and SPNL areas of the Gay Mine Site between 2016 and 2017. Water levels were measured in these wells in 2018 during groundwater sampling. Groundwater elevations in the SPNL wells ranged between approximately 5,056 and 5,079 feet in 2018 and groundwater elevations in the South 40 wells ranged between approximately 5,175 and 5,250 feet in 2018. The East Limb groundwater elevations were roughly 500 to 700 feet higher than the groundwater elevations measured in the SPNL or South 40 areas. Groundwater flow in the East Limb appears to be northeasterly based on the available data. The large groundwater elevation difference between the East Limb and the South 40 and SPNL areas suggests that the East Limb groundwater is hydrologically separate from the South 40 and SPNL areas. This is supported by the difference in interpreted groundwater flow systems which indicates that the East Limb groundwater system is not connected to the SPNL or South 40 groundwater systems. Groundwater flow in the South 40 (northern section) and SPNL areas is northerly (Golder 2018a). Water level measurements from all Wells Formation monitoring wells are provided in Table 2.2-2.

2.2.2.2 Dinwoody Formation Groundwater

Dinwoody Formation groundwater was encountered in MW-EL-03 and borehole EL-01. The Dinwoody Formation is discontinuous in the East Limb Area, as evidenced by the exposures of Phosphoria and Wells Formation (older formations) in the central portion of the East Limb, where the mine pits were excavated. MW-EL-03 is located on the west side of the East Limb and borehole EL-01 is located on the east side of East Limb, indicating the Dinwoody Formation groundwater areas intersected during drilling at these locations are isolated from one another. Only minor quantities of groundwater (0.5 gpm or less) were encountered in the Dinwoody Formation during the drilling of MW-EL-03. The flow direction and discharge point of Dinwoody Formation groundwater in the vicinity of MW-EL-03 is unknown.

Much higher production rates (estimated at 300 gpm or higher in certain zones) were encountered in the Dinwoody Formation during the drilling of borehole EL-01. Dinwoody Formation groundwater appears to discharge to springs in this area. There are several springs that occur in the vicinity of borehole-EL-01 (Figure 2.2-1). A geochemical comparison of samples collected from borehole EL-01 and spring SW-040 indicates that the water in these locations is derived from a common source (Section 3.2.1.2).

2.2.3 Well Development

Wells MW-EL-03 and MW-EL-02 were developed by Thomas Drilling in late July and late September 2018, respectively. The wells were developed by surging and pumping with a submersible pump. The pumping rates and measured drawdown during development provide some preliminary information on the hydraulic properties at each well. Details are provided below.

- MW-EL-02: The well was pumped for 5.5 hours at 4 gpm (826 gallons total) and the measured drawdown was less than one foot. Turbidity was measured at less than 10 nephelometric turbidity units (NTU). Elevated pH (9.69 to 11.85 standard units [s.u.]) was observed during the initial development of this well. The well was subsequently pumped 2 more times at much higher volumes: (1) approximately 4,300 gallons were purged over 6.5 hours on September 10, 2018, and (2) approximately 5,000 gallons were purged over about 7 hours on September 14, 2018. Total drawdown during these pumping periods was less than 2 feet. In both instances the pH dropped over the course of pumping but then increased after pumping ceased. When low-flow sampling was performed on October 18, 2018, the pH was 12.25 s.u. The elevated pH, along with the water quality results, suggests that cement grout associated with the monitoring well construction is in contact with the well screen (Section 3.2.1.1). The decline in pH during pumping indicates the elevated pH is a near-well issue and not indicative of the groundwater system.
- MW-EL-03: The well was pumped for 60 minutes at 40 to 50 gpm and the measured drawdown was about 15 feet. During development, the submersible pump was moved through the screen interval and the development water became visibly clear. During low-flow sampling, the turbidity of the purge water was 1.41 NTU.

2.2.4 Groundwater Sampling

The initial plan for sampling was to purge three casing volumes from the monitoring wells with a submersible pump and then collect samples using dedicated disposable bailers. However, the sampling method was revised due to: (1) high turbidity levels in the initial sample that was collected with the bailer method, and (2) difficulty retrieving the bailers because of friction generated between the bailer and steel well casing. Instead, dedicated bladder pumps were installed in all 8 Wells Formation monitoring wells in October and the wells were sampled using low-flow sampling methods. Groundwater quality samples were collected in October 2018 from:

- Phase 2 South 40 Wells (MW-S40-1, MW-S40-2, and MW-S40-3)
- Phase 1 SPNL Wells (MW-SPNL-1 and MW-SPNL-3)
- Phase 1 EL Wells (MW-EL-02 and MW-EL-03).

No analytical sample was collected from MW-SPNL-2 due to a pump and/or tubing malfunction that could not be resolved before this location became inaccessible in late fall 2018. Additionally, an incomplete sample set (short 3, 1-liter bottles for radiochemical analyses) was collected from Well MW-EL-03 due to a tubing malfunction. We anticipate replacing the tubing in these two wells in the spring or summer of 2019.

One duplicate sample was collected for the organic and inorganic analyses, meeting the 1 in 20 sample frequency provided in the QAPP Section 2.5 (Golder 2015c). The wells were purged and sampled with dedicated QED Environmental Systems-brand bladder pumps and compressed nitrogen gas using standard low-flow sampling methods. Filtered and unfiltered samples were collected. Samples were filtered in the field using the bladder pump. Field parameters were collected and recorded throughout the development and purging processes. Decontamination procedures were followed as described in the 2015 QAPP (Attachment A, TG-1.2-20). Analytical methods and results are provided on Table 3.2-1 for the inorganic analytes and Table 3.2-2 for the field-collected parameters. The analytical parameters that were tested are provided in Table 1.1-1.

3.0 SUMMARY OF RESULTS

This section provides a summary and discussion of the sample results. A data validation summary and review are provided in Appendix D.

3.1 Surface Water Results

Surface water samples were collected from 46 sites in May 2018 and 36 sites in September 2018. For quality control purposes duplicates, matrix spike/matrix spike duplicate (MS/MSD) volumes, and blanks were collected for each event, three sets in May and two sets in September. No decontamination was required for this sampling effort as all materials used were disposable. Surface water samples consisted of filtered and unfiltered samples. Filtered samples were analyzed for dissolved analytes and unfiltered samples were evaluated for total analyte analysis. Results are presented in Tables 3.1-1 and 3.1-2, for total and dissolved fractions respectively, along with the ecological screening levels (ESLs) and human health screening levels (HHSLs) for comparison. General water chemistry results are provided in Table 3.1-3. *In-situ* measurements for conductivity, dissolved oxygen, oxidation-reduction potential, pH, temperature, turbidity, and flow were collected at all water sample sites and are presented in Table 3.1-4.

The tables also provide a description of the waterbody types. Categories were made more inclusive and anything referred to as a seep is listed as a spring as they are very similar hydrologic features. Ponds are distinguished from pit lakes as they were not formed from mining operations or were naturally occurring. Only one river (Portneuf) is present in the study area, all other flowing waters are listed as streams, unless otherwise designated as springs.

Overall, there is high variability between sites and between spring and fall 2018 sampling results at individual sites (Tables 3.1-1 and 3.1-2). A brief summary of the results by water type are provided below.

- **Pit Lakes**: The O,P Pit (SW-003) Lake had the highest total dissolved solids (TDS) concentrations at 1,000 milligrams per liter (mg/L; Spring 2018) and 1,780 mg/L (Fall 2018). TDS concentrations at the other Pit Lakes ranged from 339 to 825 mg/L. The highest total selenium concentrations were measured in the A12 Pit Lake (SW-013; 86.8 microgram per liter [µg/L] in Spring 2018 and 82.6 µg/L in Fall 2018). The JD/JF Pit Lake (SW-016) showed the most variability between spring and fall sampling with 71.5 µg/L total selenium in the spring sample and 24.3 µg/L in the fall sample. Similarly, total selenium in the O,P Pit Lake (SW-003) ranged between 48.5 µg/L in the spring and 18.9 µg/L in the fall. At the East Limb Pit Lakes, total selenium concentrations ranged between 27.1 µg/L (spring) and 29.7 µg/L (fall) at the Z Pit, while the W Pit had much lower total selenium concentrations (1.4 µg/L in spring and 0.9 µg/L in fall). Total Manganese concentrations were below 50 µg/L at the A12 Pit Lake (SW-013), JD/JF Pit Lake (SW-016), and the Z Pit Lake (SW-025). Total manganese concentrations at the O,P Pit Lake (SW-003) ranged from 231 µg/L to 463 µg/L, with the highest concentrations occurring in the fall. Total manganese concentrations at the W Pit (SW-029) ranged from 212 µg/L (spring) to 119 µg/L (fall).
- **Springs:** Water quality was variable between the springs. The highest TDS concentrations were measured in the fall at SW-036 (1,760 mg/L), with a lower concentration (578 mg/L) in the spring. TDS concentrations at all other sites ranged between 103 mg/L and 907 mg/L. The highest total manganese concentrations were also measured in the fall at SW-036 (14,200 µg/L). Six sites had manganese concentrations below 50 µg/L in both the spring and fall sample. The highest total selenium concentrations were measured at SW-040 (46.2 µg/L in spring and 63.4 µg/L in fall) and SW-48 (43.7 µg/L in spring and 28.8 µg/L in fall).

Total selenium at Queedup Springs was 8.2 µg/L (spring) and 9.1 µg/L (fall). Total selenium concentrations at all other springs were below 5 µg/L.

- **Ponds:** TDS concentrations in the Ponds ranged from 258 mg/L (SW-004A in spring) to 1,070 mg/L (SW-012 in fall). Total selenium concentrations were below 5 µg/L at pond sites in both the spring and fall, although spring and fall samples from SW-004A and SW-012 were above 3.1 µg/L dissolved selenium screening level for lentic systems. Only the spring sample from SW-010 and SW-011 had dissolved selenium above 3.1 µg/L. Total manganese concentrations above 50 µg/L were found in the spring and fall samples from SW-010, SW-012, and SW-030. At SW-004A, only the fall sample was above 50 µg/L; while at SW-011, only the spring sample exceeded the screening criteria.
- **Creeks**: TDS concentrations in the creeks ranged from 867 mg/L at SW-015 (Willow Creek) in the spring to 96 mg/L at SW-019 (Ross Fork) in the spring. Total selenium concentrations were below 5 µg/L at all creek sites during both the spring and fall. Dissolved selenium concentrations exceeded the lotic screening value of 1.5 µg/L at 4 creek sites in the spring (SW-015, SW-002, SW-037, and SW-049), and only SW-049 in the fall. Total manganese concentrations were below 50 µg/L at the majority of the sites; only SW-018 (spring), SW-002 (spring), SW-015 (fall), and SW-035 (spring and fall) had total manganese concentrations greater than 50 µg/L.
- **Portneuf River**: TDS concentrations ranged from 273 mg/L to 622 mg/L at 3 monitoring stations on the Portneuf River (SW-023, SW-024A, and SW-031). Total and dissolved selenium concentrations were below screening levels in all samples and total manganese concentrations were below 50 µg/L in all but one sample (spring sample at SW-031).

Similar patterns between total and dissolved constituents are evident in most samples. Consistent with previous sampling, there is no definitive pattern between onsite and offsite sampling locations; where samples from both areas may have exceedances for both ESLs and HHSLs.

3.1.1 Surface Water Results Compared to Ecological Screening Levels

Dissolved arsenic, barium, and boron exceeded ESLs at all sampled locations both on and off Site. The highest dissolved arsenic concentrations were measured in W Pit Lake (SW-029), with the highest concentrations (57.5 µg/L) measured in the fall at this location. Concentrations of dissolved cadmium, copper, magnesium, manganese, nickel, silver, uranium, vanadium, and zinc exceeding the ESL were measured at several locations, all on disturbed or downgradient sites. Dissolved calcium, selenium, and uranium were detected at concentrations greater than the ESL in both disturbed/downgradient sites as well as background/upgradient locations; however, the highest concentrations were measured in disturbed/downgradient sites.

3.1.1.1 Salamander Mortalities

There were more salamander mortalities observed in 2018 than in the previous rounds of surface water sampling in 2015 and 2016. Following is a summary of the locations that had salamander mortalities, along with the corresponding concentration of dissolved selenium:

- SW-010 (spring): Se = 3.3 µg/L. SW-010 (fall): Se = 0.6 µg/L. This location is one of the ponds above the A-12 Pit in the Headquarters Area.
- SW-011 (spring): Se = 2.4 µg/L. SW-011 (fall): Se = 0.6 µg/L. This location is one of the ponds above the A-12 Pit in the Headquarters Area.

- SW-013 (spring): Se = 86.1 µg/L. SW-013 (fall): Se = 81.7 µg/L. This location is the A-12 Pit lake in the Headquarters Area.
- SW-016 (fall): Se = 24.4 µg/L. This location is the JD/JF Pit lake in the South 40 Area.
- SW-025 (fall): Se = 29.8 µg/L. This location is the Z Pit lake in the East Limb.
- SW-041 (spring): Se = 1.9 µg/L. This location is a spring catch basin northeast of II-2 overburden area in the East Limb.
- SW-042 (spring): Se = 0.8 µg/L. This location is a spring catch basin northeast of AA-2 overburden area in the East Limb.

Live salamanders were observed in the following locations:

- SW-013 (spring): Se = 86.1 µg/L.
- SW-016 (fall): Se = 24.4 µg/L.
- SW-037 (fall): Se = 0.6 µg/L. This location is in Willow Creek downstream of the South 40 Area.

The salamanders were observed most often in the larger bodies of water, which are the pit lakes at this site that generally have higher concentrations of selenium than the surrounding springs or streams. Live salamanders were observed in the same location as dead ones in the A-12 Pit in the spring and the JD/JF Pit in the fall. To put these numbers into context with some literature values, Oleander (2003) reports a 7-day lethal concentration for half the test organisms (LC_{50}) for the South African clawed frog (*Xenopus laevis*) at 456 µg/L and a 7-day LC_{50} for narrow-mouthed toad (*Gastrophryne carolinensis*) embryos as 90 µg/L. This is not intended to be a thorough research report on selenium toxicity to amphibians, nor imply that selenium is the only possible stressor, rather is presented to give context to the concentrations of dissolved selenium measured at the time of the salamander mortalities. There are many other potential explanations for the observed mortalities, including issues unique to ephemeral ponds such as fluctuating temperatures, fluctuating concentrations of other water quality parameters (including dissolved oxygen), and eventual crowding of individuals which may increase the rate of transmission of certain infectious agents such as iridovirus, which has been implicated in large-scale die-offs of the United States western tiger salamanders (USGS 2000). The issue of amphibian mortalities in the ponds at the Site will be discussed in greater detail in the Baseline Ecological Risk Assessment.

3.1.2 Surface Water Results Compared to Human Health Screening Levels

Human health exceedances are only related to total fractions of metals, general chemistry, and field parameters. No HHSLs apply to the dissolved fraction results.

Total arsenic and boron exceeded HHSLs at all sampled locations both on and off site. Total cadmium, hexavalent chromium, cobalt, copper, lead, molybdenum, nickel, silver, and thallium were in exceedance at some locations, all on disturbed or downgradient sites in the eastern and northern areas of the Site. Concentrations of total iron, manganese, and selenium exceeding the screening level were detected in numerous sites including both disturbed/downgradient sites as well as background/upgradient sites. Many sites at both disturbed and background areas are also in exceedance for iron. Iron appeared to be elevated at streams in the spring and at lakes/ponds in the fall.

3.2 Groundwater Results

Groundwater samples were collected between October 17 and October 22, 2018. Water quality samples were collected from Wells Formation wells in the South 40, the SPNL, and the East 40 areas. Both total and filtered samples were collected. Results are presented in Table 3.2-1 along with comparisons to HHSLs and are discussed below.

Groundwater analysis results are compared to both maximum contaminant levels (MCLs) and HHSLs for groundwater. The MCLs are derived by the EPA and are legally enforceable primary standards that apply to public water systems. In comparison, the HHSLs are based on toxicity data from a residential exposure scenario and are not enforceable standards. Both values are shown to give a general idea of the water quality, both as it relates to screening contaminants against HHSLs and as the groundwater compares to general drinking water quality (MCLs).

3.2.1 East Limb Wells

2018 was the first year of water quality sampling at MW-EL-02 and MW-EL-03. A screening level water sample was collected directly from borehole EL-01 well prior to borehole abandonment.

3.2.1.1 Wells Formation Monitoring Wells

The water quality in MW-EL-03 was generally similar to the Wells Formation groundwater quality measured in the South 40 and SPNL wells (Table 3.2-1), except for arsenic. Arsenic concentrations in MW-EL-03 were 18.8 µg/L (dissolved) and 25.0 µg/L (total); while arsenic concentrations in all other Wells Formation wells were below 1.5 µg/L in 2018. The source of arsenic in this well is unknown but may be related to proximity to volcanic rocks or thermal groundwater. The pH of MW-EL-03 was neutral (7.28 s.u.) and similar to the pH measured in the South 40 and SPNL Wells Formation monitoring wells in 2018 (Table 3.2-2). TDS in MW-EL-03 was 459 mg/L, total alkalinity was 248 mg/L, and nitrate was <0.05 mg/L.

In MW-EL-02, arsenic concentrations were low (0.18 µg/L dissolved and 0.39 µg/L total), but the pH was elevated (12.25 s.u.). The elevated pH in MW-EL-02 is likely caused by the intrusion of grout near the well screen during well construction (Section 2.2.3). The other monitoring wells completed in the Wells Formation have neutral or near-neutral pH (Table 3.2-2). The general chemistry from MW-EL-02 is compared to the other 6 Wells Formation wells sampled in 2018 on a Piper Diagram on Figure 3.2-1. The figure shows much higher relative abundance of chloride and calcium (associated with the cement used in the grout) in MW-EL-02 compared to the other wells.

Concentrations of certain metals, including selenium, were also higher in MW-EL-02 compared to the other Wells Formation monitoring wells. For example, total selenium was 47.5 µg/L in MW-EL-02 compared to 1.2 µg/L in MW-EL-03. The selenium concentrations, and other metals, in this well may be impacted by the high pH conditions caused by the grout intrusion. Increased pH can lead to the desorption or mobilization of naturally occurring selenium in the native geologic material immediately adjacent to the well. The decrease in pH observed during the long-term pumping of this well during well development (Section 2.2.3), indicates this is a near-well condition and not indicative of natural groundwater conditions in the area.

Concentrations of target analytes were generally less than the HHSLs at MW-EL-02 and MW-EL-03 except for the analytes detailed below.

- Concentrations of total and dissolved arsenic exceeded the screening level for each location. MW-EL-02 ranged from 0.18 (dissolved) to 0.39 µg/L (total). Arsenic concentrations in MW-EL-03 ranged from 18.8 µg/L (dissolved) and 25 µg/L (total), these concentrations also exceed the MCL for arsenic.
- Elevated concentrations of barium were detected in MW-EL-02 (1,120 µg/L dissolved, 1,380 µg/L total).
- Hexavalent chromium concentrations exceeding the HHSL were detected in both wells. Concentrations of both dissolved and total fractions ranged from 0.381 µg/L (MW-EL-03) to 16.8 µg/L (MW-EL-02).
- Concentrations of total and dissolved iron in MW-EL-03 exceeded the HHSL (maximum 924 µg/L).
- Manganese concentrations exceeded the HHSL and MCL in samples from MW-EL-03. Concentrations ranged from 97.1 µg/L (dissolved) and 105 µg/L (total).
- Molybdenum concentrations measured in MW-EL-03 ranged from 318 µg/L (total) to 328 µg/L (dissolved), which are greater than the molybdenum HHSL.
- Total and dissolved selenium concentrations exceeded the HHSL in the sample from MW-EL-02. Concentrations ranged from 52.5 µg/L (dissolved) and 47.5 µg/L (total).
- MW-EL-02 contained concentrations of thallium (maximum of 0.119 µg/L) exceeding the HHSL.
- TDS concentrations were elevated above the HHSL in MW-EL-02, with a concentration of 721 µg/L.
- Radioactivity measured as gross beta exceeded the HHSL in MW-EL-02.

3.2.1.2 Borehole EL-01

The borehole EL-01 sample was collected by lowering a submersible pump into the borehole, pumping the equivalent of 3 casing volumes, allowing water levels to recover, and then collecting the sample with a disposable bailer. The sample collection methods were detailed in an email to EPA dated August 24, 2018. It is noted that the sample collection methods were not done in accordance with the Project QAPP because the borehole did not conform to monitoring well standards. Therefore, the results provide a general estimate of groundwater quality but may not precisely represent actual groundwater quality concentrations. The results are shown on Table 3.2-1 and 3.2-2 and analytes exceeding the HHSL are summarized below.

- Selenium concentrations were 178 µg/L (total) and 176 µg/L (dissolved).
- Arsenic concentrations were 0.25 µg/L (total) and 0.18 µg/L (dissolved).
- Concentrations of hexavalent chromium were 0.042 µg/L (dissolved).
- Concentrations of iron were 5,400 µg/L (total) and 368 µg/L (dissolved).
- Manganese concentrations were 323 µg/L (total) and 289 µg/L (dissolved).
- TDS concentration was 5,010 mg/L.

A sample was also collected from a nearby surface water monitoring station SW-040 in August 2018 for comparison. SW-040 is a spring that is located approximately 500 to 1,000 feet north-northeast of borehole EL-01 (Figure 2.1-1). The borehole EL-01 and SW-040 samples are compared graphically on a Piper Diagram in Figure 3.2-2. Piper diagrams are used to compare the ionic composition of water samples. Figure 3.2-2 indicates nearly identical water types between borehole EL-01 and SW-040 where magnesium and bicarbonate dominate. The SW-040 sample has slightly more calcium than borehole EL-01. This may be attributed to the additional source area that is contributing flow to SW-040. The anions (chloride, sulfate, and bicarbonate) are identical and plot directly on top of each other on Figure 3.2-2.

The results indicate that borehole EL-01 and SW-040 share a common source and SW-040 is representative of Dinwoody Formation groundwater. This is supported by an earlier geologic and hydrogeologic investigation of the area, which suggests that the approximate elevation of SW-040 corresponds to a Dinwoody Formation groundwater discharge point (Corbet 1980). The static groundwater level in borehole EL-01 also indicates a hydraulic connection between these sites. The groundwater elevation in borehole EL-01 was approximately 5,900 feet compared to an estimated elevation of 5,850 feet at SW-040. This indicates that groundwater in borehole EL-01 is upgradient of SW-040.

Elevated selenium concentrations are attributed to proximity to potential source areas. Borehole EL-01 was drilled through overburden to the east of the BB and II pits.

3.2.2 South 40 Area Wells Formation Wells

2018 was the second year of water quality sampling at MW-S40-1 and MW-S40-2 and the third year of water quality sampling at MW-S40-3. The 2018 sample results from MW-S40-3 were generally similar to the 2017 sample results. Overall, water quality concentrations are generally below HHSLs in Wells Formation groundwater in the South 40. The pH of the samples ranged from 7.83 to 8.38 s.u., and alkalinity ranged between approximately 164 mg/L and 363 mg/L. TDS concentrations ranged from 186 mg/L (MW-S40-3) to 745 mg/L (MW-S40-1). Nitrogen concentrations were less than 0.23 mg/L in all three wells.

Selenium concentrations were below 6 µg/L (0.7 to 5.9 µg/L) in both the total and dissolved fractions from all three wells. Concentrations of aluminum, chromium, chromium III, cobalt, copper, iron, manganese, and vanadium decreased to less than the HHSLs in 2018. The following analyses exceeded the HHSLs in 2018:

- Arsenic concentrations ranged from 0.75 to 1.16 µg/L (dissolved) and 0.81 to 1.46 µg/L (total).
- Hexavalent chromium concentrations in MW-S40-2 and MW-S40-3 ranged from 0.037 to 0.488 µg/L (total and dissolved fractions).
- Concentrations of total iron were less than the HHSL, except for MW-S40-1 which was 363 µg/L. Dissolved fractions were less than the screening level for each well.
- Total and dissolved molybdenum concentrations in MW-S40-3 were 12.1 µg/L.
- Concentrations of nickel exceeding the HHSL were detected in MW-S40-2 ranging from 43.6 to 48.8 µg/L (total and dissolved fractions).
- Dissolved thallium concentrations greater than the HHSL were detected in MW-S40-1 (0.046 µg/L) and MW-S40-3 (0.024 µg/L).
- Concentrations of TDS exceeding the HHSL were detected in MW-S40-1 and MW-S40-2 (maximum of 745 µg/L).
- Total and dissolved radioactivity (Gross Beta) concentrations exceeded HHSL in MW-S40-1 and MW-S40-2.

3.2.3 Southern Portion of North Limb Area

2018 represents the second year of sample collection from the three wells in the SPNL Area. Note that due to pump/tubing malfunction, no sample was collected from MW-SPNL-2. Overall, the water quality in these wells is generally similar to the Wells Formation groundwater in the South 40 Area. Alkalinity ranged between 184 mg/L and 215 mg/L and pH was between 7.94 and 8.34 s.u. TDS was less than 315 mg/L and selenium concentrations (total and dissolved) were under 5 µg/L in MW-SPNL-3 and 8.7 µg/L in MW-SPNL-1. Although detected at concentrations greater than the screening level in 2017, concentrations of aluminum, antimony, barium, chromium, chromium III, cobalt, copper, iron, manganese, nickel, vanadium, zinc, and radioactivity (gross alpha and gross beta) decreased to less than the HHSLs in the SPNL wells in 2018. The improved water quality in 2018 compared to 2017 may be associated with the additional time (1 year) since the wells were installed installations that has allowed groundwater in the vicinity of the wells to equilibrate with antecedent formation conditions. The following analytes exceeded the HHSLs in 2018:

- Arsenic concentrations ranged from 0.67 to 1.16 µg/L (dissolved) and 0.74 to 1.1 µg/L (total).
- Hexavalent chromium concentrations (dissolved and total) were 2.32 µg/L and 2.34 µg/L in MW-SPNL-1 and 0.093 µg/L and 0.037 µg/L in MW-SPNL-3.
- Concentrations of total and dissolved molybdenum (maximum of 18 µg/L) exceeding the HHSL were detected in MW-SPNL-3.
- Thallium concentrations ranged from 0.059 µg/L (total) to 0.062 µg/L (dissolved) in MW-SPNL-3.

3.2.4 Groundwater Results Compared to Maximum Contaminant Levels

The majority of the 2018 groundwater samples were below primary and secondary MCLs, with the following exceptions:

- Arsenic (total and dissolved samples from MW-EL-03)
- Iron (secondary MCL, total sample from MW-S40-1)
- Manganese (secondary MCL, total and dissolved samples from EL-01 and MW-EL-02)
- Selenium (total and dissolved sample from EL-01 and dissolved sample from MW-EL-02).

3.3 Overall Data Validation Notes

All analytical data packages were validated in accordance with EPA National Functional Guidelines. All data were found acceptable and are usable for decision making purposes. Full data validation packages that detail qualified data are included in Appendix D.

4.0 SUMMARY OF PROPOSED WORK FOR 2019

Work proposed for 2019 includes the following:

- An additional round of surface and groundwater sampling will be completed in 2019.
- Collect additional soil samples from across the Site to continue to characterize COPC concentrations. A new RIWP Addendum detailing the methods and sample locations will be developed and submitted for agency and Tribal review and EPA approval.

Signature Page

Golder Associates Inc.

DRAFT	**DRAFT**
Jeremy Clark	Gary Zimmerman
Project Environmental Toxicologist	*Principal - Senior Consultant*

DRAFT

Jay Pietraszek
Senior Hydrologist

JC/JP/sb

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Tables

Table 1.1-1: COPCs Requested for Analysis by Media

	Media	
COPCs	**Surface Water**	**Groundwater**
Aluminum	x	x
Antimony	x	x
Arsenic	x	x
Barium	x	x
Beryllium	x	x
Boron	x	x
Cadmium	x	x
Chromium (Total)		
Chromium (III)	x	x
Chromium (VI)	x	x
Cobalt	x	x
Copper	x	x
Iron	x	x
Lead	x	x
Magnesium	x	x
Manganese	x	x
Mercury	x	x
Molybdenum	x	x
Nickel	x	x
Selenium	x	x
Silver	x	x
Thallium	x	x
Total Uranium	x	x
Total Radium		x
Vanadium	x	x
Zinc	x	x
Gross Alpha		x
Gross Beta		x
Ra-226, Ra-228		x
Alkalinity	x	x
Hardness	x	x
Nitrogen, total Kjeldahl	x	x
Nitrate, Nitrite	x	x
Phosphorous	x	x
Potassium	x	x
Sulfate	x	x
Sodium	x	x
Total Dissolved Solids	x	x
Calcium	x	x
Chloride	x	x
Total Suspended Solids	x	

Notes:
x = Media specific COPCs
Table taken from Table QAPP-28 in the 2015 Quality Assurance Project Plan Report (Golder 2015c)

Table 2.1-1: Surface Water Sample Locations

Site No.	Site Description	Sampled?	Geographic Coordinates[2]		UTM Coordinates[3]		Site Type [1]
			Latitude	Longitude	X	Y	
001	Lincoln Creek (downstream of Dry Hollow Creek)	Dry	43° 06' 57.8"	112° 07' 13.5"	408847.3	4774312	Downgradient
002	Lincoln Creek below North Limb	Yes (Spring)	43° 06' 16.1"	112° 06' 34.6"	409710.5	4773014	Downgradient
003	O, P Pit Lake	Yes	43° 05' 43.7"	112° 05' 17.7"	411435	4771993	On Disturbance
004A	Cattle Pond A above O, P Pit (near reclaimed area)	Yes	43° 05' 31.2"	112° 05' 00.1"	411828.5	4771601	On Disturbance
004B	Cattle Pond B above O, P Pit (near reclaimed area)	Dry	43° 05' 31.7"	112° 05' 00.5"	411819.7	4771616	On Disturbance
005	Lincoln Creek above North Limb	Yes (Spring)	43° 05' 29.9"	112° 05' 04.7"	411723	4771561	Upgradient
006	Covered Springs (East of Site on Lincoln Creek)	Yes	43° 06' 06.4"	112° 03' 41.3"	413623.8	4772664	Upgradient
007	Bronco Springs (almost due east of K Pit)	Yes	43° 04' 38.8"	112° 04' 04.2"	413071.7	4769969	Upgradient
008	Cow Spring / Unnamed pond near cattle trough (above K Pit)	Yes	43° 04' 37.4"	112° 05' 31.4"	411099.3	4769950	On Disturbance
009	Source of Bunkhouse Spring	Yes (Spring)	43° 03' 00.0"	112° 05' 05.6"	411643.9	4766938	Upgradient
010	Pond #3 / Main Holding Pond above A12 Pit	Yes	43° 02' 50.5"	112° 05' 51.7"	410597.1	4766659	Upgradient
011	Pond 1 above A12 Pit (East)	Yes	43° 02' 48.4"	112° 05' 52.9"	410569.1	4766595	On Disturbance
012	Pond 2 above A12 Pit (West)	Yes	43° 02' 48.1"	112° 05' 58.6"	410440.1	4766587	On Disturbance
013	A12 Lake in A12 Pit	Yes	43° 02' 42.8"	112° 06' 19.2"	409971.8	4766430	On Disturbance
014	Big Willow Springs	Yes	43° 01' 57.3"	112° 05' 31.5"	411032.8	4765012	Upgradient
015	Willow Creek	Yes	43° 01' 00.5"	112° 07' 17.2"	408617.4	4763291	Downgradient
016	Lake in JD/JF Pit	Yes	43° 01' 09.8"	112° 07' 44.8"	407996.5	4763587	On Disturbance
017	Danielson Creek (above Ross Fork Creek)	Dry	43° 01' 15.8"	112° 09' 35.1"	405502.5	4763806	Upgradient
018	Ross Fork Creek (downstream of Danielson Creek)	Yes	43° 00' 53.4"	112° 09' 48.7"	405185.2	4763119	Downgradient
019	Ross Fork above the Narrows	Yes	43° 00' 36.1"	112° 07' 59.3"	407654.3	4762551	Downgradient
020	Big Springs (spring only)	Yes	42° 59' 14.7"	112° 07' 22.4"	408456.1	4760030	Upgradient
021	Jeff Cabin Creek (water source for Falkner Ranch)	Yes	42° 57' 16.0"	112° 02' 14.8"	415376.9	4756278	Upgradient
022	Lower Big Jimmy Creek Spring (area feeding into Portneuf River)	Yes	43° 00' 07.0"	111° 59' 57.3"	418555.1	4761515	Upgradient
023	Portneuf River (downstream of Bakers Creek)	Yes	43° 01' 15.2"	111° 58' 57.3"	419938.1	4763603	Downgradient
024A	Portneuf River (above Bakers Creek)	Yes	43° 01' 23.1"	111° 58' 43.9"	420243.8	4763844	Downgradient
025	Z Pit Lake	Yes	43° 01' 12.2"	112° 01' 46.7"	416102.5	4763556	On Disturbance

Table 2.1-1: Surface Water Sample Locations

Site No.	Site Description	Sampled?	Geographic Coordinates[2]		UTM Coordinates[3]		Site Type [1]
			Latitude	Longitude	X	Y	
026	Queedup Springs (by Lone Pine Canyon Road)	Yes	43° 01' 33.3"	112° 01' 30.9"	416468.4	4764203	Downgradient
027	Bakers Creek below East Limb (above Queedup Springs)	Dry	43° 01' 38.5"	112° 01' 44.5"	416161.6	4764367	Downgradient
028	Lone Pine Spring (Y Spring South, along Lone Pine Road)	Yes	43° 01' 34.1"	112° 02' 59.9"	414454.5	4764253	Upgradient
029	W Pit Lake	Yes	43° 02' 11.7"	112° 01' 48.2"	416091.4	4765392	On Disturbance
030	East Limb North Pond / Holding pond below Y intersection	Yes	43° 02' 29.6"	112° 03' 44.1"	413475.8	4765977	Upgradient
031	Portneuf River (above U Creek)	Yes	43° 04' 20.6"	112° 00' 28.1"	417951.6	4769346	Upgradient
032	Red Rock Spring	Yes (Spring)	43° 06' 03.1"	112° 01' 13.6"	416961.9	4772523	Upgradient
033	Mud Springs (north & east of mine, along road near Red Rock Spring)	Yes	43° 06' 09.2"	112° 01' 50.1"	416138.4	4772719	Upgradient
034	North Fork of Bakers Creek	Yes	43° 01' 21.1"	111° 58' 57.2"	419942	4763785	Downgradient
035	U Creek (above confluence with Portneuf River)	Yes	43° 04' 19.4"	112° 00' 30.8"	417890.1	4769310	Downgradient
036	Seep and Pond below EE-2	Yes	43° 01' 43.9"	112° 03' 06.4"	414312	4764558	Downgradient
037	Willow Creek (Downstream of South 40 Area, upstream of Ross Fork Creek)	Yes	43° 00' 44.9"	112° 07' 43.7"	408010	4762819	Downgradient
038	Lincoln Peak Spring (Above and east of the M Pit area)	Yes	43° 05' 13.4"	112° 04' 17.3"	412789	4771039	Upgradient
039	Y Spring (Between SW-014 and SW-015)	Yes	43° 01' 24.0"	112° 06' 20.2"	409917	4763999	Downgradient
040	Seep east of 11-2 Overburden Disposal Area (OBDA)	Yes	43° 02' 48.4"	112° 02' 13.4"	415534	4766532	On Disturbance
041	Catch Basin northeast of 11-2 OBDA	Yes (Spring)	43° 02' 52.4"	112° 02' 28.2"	415203	4766660	On Disturbance
042	Catch Basin northeast of AA-2 OBDA	Yes (Spring)	43° 02' 34.4"	112° 02' 07.2"	415671	4766099	Downgradient
043	Spring east of AA-2 OBDA	Yes	43° 02' 34.7"	112° 01' 53.6"	415977	4766104	Downgradient
044	Seep Area above and northeast of W Pit	Yes (Spring)	43° 02' 16.0"	112° 02' 00.5"	415815	4765528	On Disturbance
045	BB-2 North Spring and Pond	Yes	43° 02' 37.9"	112° 02' 47.8"	414752	4766218	On Disturbance
046	Pond on Lone Pine Road	Yes (Spring)	43° 01' 43.6"	112° 02' 08.8"	415615	4764530	Downgradient
047	Seep and Pond below FF-2	Yes (Spring)	43° 01' 53.0"	112° 03' 40.1"	413551	4764848	Downgradient
048	Spring box below OBDA 11 (downstream of SW-040)	Yes	43° 02' 49.5"	112° 02' 5.1"	415724.3	4766561	Downgradient
049	Lincoln Creek (downstream of Yandell and Warm Springs)	Yes	43° 07' 40.8"	112° 10' 45.1"	404083	4775705	Downgradient

Notes:
[1] Site Types: Upgradient = Unimpacted site; On Disturbance = Located on the Site; Downgradient = Downgradient of Site
[2] Projection = Geographic (latitude/longitude) NAD83, reported in degrees, minutes, seconds
[3] Projection = UTM NAD83 (Zone 12), reported in meters
Dry = not sampled in spring or fall due to absence of water

Table 2.2-1: Wells Formation Regional Groundwater Monitoring Well Details (Phase 2 South 40 Monitoring Wells, Phase 1 SPNL, and East Limb Monitoring Wells)

Monitoring Well ID	Date Completed	Description	Plane East (ft)		Top of Casing Elevation (ft AMSL)	Top of Monument casing (ft AMSL)	Ground Elevation (ft AMSL)	Well and Screen Casing Diameter (inches)	Depth Drilled (ft bgs)	Depth of Well (ft bgs)	Screen Interval (ft bgs)	Filter Pack Interval (ft bgs)
			Northing (Y)	Easting (X)								
MW-S40-1	Jul-17	Regional Groundwater - South 40	497086.08	664318.15	5770.72	5771.35	5768.5	4	838	825	790-820	780-838
MW-S40-2	Jul-17	Regional Groundwater - South 40	491388.91	666910.21	5683.31	5683.99	5680.9	4	560	555	520-550	510-559
MW-S40-3	Oct-16	Regional Groundwater - South 40	489520.86	670160.43	5686.72	5687.05	5684.1	4	617	617	595-615	588-617
MW-SPNL-1	Aug-17	Regional Groundwater - Headquarters	502756.06	670598.27	5652.50	5653.15	5650.6	4	635	606	582-602	560-604
MW-SPNL-2	Aug-17	Regional Groundwater - Headquarters	502382.26	669765.45	5703.72	5705.01	5701.4	4	679	675	630-670	620-675
MW-SPNL-3	Aug-17	Regional Groundwater - Headquarters	503753.80	670569.53	5739.60	5740.11	5737.5	4	740	738	713-733	700-738
MW-EL-02	Aug-18	Regional Groundwater - East Limb	504555.84	685287.30	5814.18	5814.65	5811.1	4	129	125	90-120	80-125
MW-EL-03	Jul-18	Regional Groundwater - East Limb	501828.99	683677.44	6060.38	6060.88	6057.1	4	636	635	610-630	605-636

Notes:

1. S40 and SPNL deep wells surveyed by A&E on August 31, 2017.
2. EL wells surveyed by A&E on August 29, 2018.

ft bgs - feet below ground surface

ft AMSL - feet above mean sea level

Table 2.2-2: Water Level Measurements for Wells Formation Groundwater Monitoring Wells

Monitoring Well ID	Top of Casing Elevation (ft AMSL)	Water Level Measurements			
		Measurement Date	Below Top of Casing (ft)	GW Elevation (ft AMSL)	Deviation Corrected GW Elevation (ft AMSL)
MW-S40-1	5770.72	11/17/2017	572.3	5198.42	5198.77
		9/4/2018	556.90	5213.82	5214.15
		10/10/2018	557.07	5213.65	5213.98
		10/20/2018	557.38	5213.34	5213.67
MW-S40-2	5683.31	11/17/2017	444.99	5238.32	5238.38
		9/5/2018	431.6	5251.71	5251.76
		10/10/2018	437.45	5245.86	5245.91
		10/20/2018	439.18	5244.13	5244.18
MW-S40-3	5686.72	11/7/2016	531.65	5155.07	5155.72
		6/27/2017	529.45	5157.27	5157.91
		7/13/2017	527.25	5159.47	5160.11
		11/16/2017	520.13	5166.59	5167.21
		9/5/2018	512.00	5174.72	5175.31
		10/10/2018	511.50	5175.22	5175.81
		10/19/2018	511.84	5174.88	5175.47
MW-SPNL-1	5652.50	11/18/2017	581.64	5070.86	5071.01
		9/6/2018	579.42	5073.08	5073.23
		10/10/2018	578.88	5073.62	5073.77
		10/22/2018	578.77	5073.73	5073.88
MW-SPNL-2	5703.72	11/18/2017	626.76	5076.96	5077.00
		9/6/2018	625.56	5078.16	5078.20
		10/10/2018	625.10	5078.62	5078.66
		10/22/2018	625.04	5078.68	5078.72
MW-SPNL-3	5739.60	11/18/2017	686.42	5053.18	5053.53
		9/6/2018	683.97	5055.63	5055.97
		10/10/2018	683.58	5056.02	5056.36
		10/22/2018	683.41	5056.19	5056.53
MW-EL-02	5814.18	9/10/2018	76.6	5737.58	NA
		9/14/2018	76.5	5737.68	NA
		10/10/2018	76.66	5737.52	NA
		10/18/2018	76.83	5737.35	NA
MW-EL-03	6060.38	8/14/2018	310.83	5749.55	NA
		9/7/2018	312.3	5748.08	NA
		9/14/2018	311.64	5748.74	NA
		10/10/2018	312.15	5748.23	NA
		10/17/2018	312.35	5748.03	NA

Notes:

1. S40 and SPNLwells surveyed by A&E on August 31, 2017.
2. Borehole deviation survey of S40 and SPNL wells completed in November 2017.
3. EL wells surveyed by A&E on August 29, 2018.

ft AMSL - feet above mean sea level

Table 3.1-1: Surface Water Sampling Results – Dissolved Fraction

						Analyte	Hardness, Calcium Carbonate		Aluminum		Antimony		Arsenic	
						CAS #	HARDCA		7429-90-5		7440-36-0		7440-38-2	
						Analysis Method	SM2340B		SW6010C		SW6020		E1632A/SW6020	
						Ecological Screening Level	N/A		N/A		N/A		0.14	
						Units	mg/l		µg/L		µg/L		µg/L	
Site	**Site Description**	**Sample Date**	**Sample QC**	**Position**	**Waterbody Type**	**Area**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
Blank	--	5/17/2018	Blank	--	--	--	0.039	J	< 3	U	< 0.020	U	0.011	J
Blank	--	5/22/2018	Blank	--	--	--	0.062	J	< 3	U	0.056		< 0.003	U
Blank	--	5/23/2018	Blank	--	--	--	0.10		< 4	U	< 0.020	U	0.013	J
Blank	--	9/13/2018	Blank	--	--	--	0.113		< 4	U	< 0.020	U	0.008	J
Blank	--	9/18/2018	Blank	--	--	--	0.087		< 3	U	0.063		0.017	J
SW-002	Lincoln Creek below North Limb	5/23/2018		Creek	Downgradient	Northwest of North Limb	391		3120		0.347		**1.26**	
SW-003	O, P Pit Lake	5/23/2018		Pit Lake	On disturbance	North Limb	661		12		0.582		**1.06**	
SW-003	O, P Pit Lake	9/20/2018		Pit Lake	On disturbance	North Limb	916		< 4	U	0.893		**2.29**	
SW-004A	Cattle Pond A above O, P Pit(near reclaimed area)	5/23/2018		Pond	On disturbance	North Limb	187		48		0.256		**0.503**	
SW-004A	Cattle Pond A above O, P Pit(near reclaimed area)	9/19/2018		Pond	On disturbance	North Limb	261		< 4	U	0.352		**0.996**	
SW-005	Lincoln Creek above North Limb	5/23/2018		Creek	Upgradient or Background	Northeast of North Limb	330		49		0.191		**0.345**	
SW-006	Covered Springs(on Lincoln Creek going to east)	5/22/2018		Spring	Upgradient or Background	Northeast of North Limb	247		52		0.082	J+	**0.188**	
SW-006	Covered Springs(on Lincoln Creek going to east)	9/19/2018		Spring	Upgradient or Background	Northeast of North Limb	237		< 4	U	0.066		**0.187**	
SW-007	Bronco Springs (almost due east of K Pit)	5/22/2018		Spring	Upgradient or Background	East of North Limb	316		< 3	U	0.094		**0.183**	
SW-007	Bronco Springs (almost due east of K Pit)	9/19/2018		Spring	Upgradient or Background	East of North Limb	303		< 4	U	0.062		**0.223**	
SW-007	Bronco Springs (almost due east of K Pit)	9/19/2018	Duplicate	Spring	Upgradient or Background	East of North Limb	305		< 4	U	0.062		**0.235**	
SW-008	Cow Spring / Unnamed pond near cattle trough(above K Pit)	5/23/2018		Spring	On disturbance	North Limb	436		158		0.125		**0.308**	
SW-008	Cow Spring / Unnamed pond near cattle trough(above K Pit)	9/20/2018		Spring	On disturbance	North Limb	373		< 4	U	0.292		**1.03**	
SW-009	Source of Bunkhouse Spring	5/21/2018		Spring	Upgradient or Background	East of North Limb	539		< 3	U	0.165		**0.541**	
SW-010	Pond #3 / Main Holding Pond above A12 Pit	5/21/2018		Pond	Upgradient*	East of Southern Part of North Limb	486		15		0.329		**0.688**	
SW-010	Pond #3 / Main Holding Pond above A12 Pit	9/18/2018		Pond	Upgradient*	East of Southern Part of North Limb	395		< 4	U	0.453		**0.748**	
SW-011	Pond 1 above A12 Pit (East)	5/21/2018		Pond	On disturbance	Southern Part of North Limb	475		7	J	0.23		**0.743**	
SW-011	Pond 1 above A12 Pit (East)	9/18/2018		Pond	On disturbance	Southern Part of North Limb	409		< 4	U	0.257		**1.30**	
SW-012	Pond 2 above A12 Pit (West)	5/21/2018		Pond	On disturbance	Southern Part of North Limb	476		33		0.287		**0.72**	
SW-012	Pond 2 above A12 Pit (West)	9/18/2018		Pond	On disturbance	Southern Part of North Limb	566		< 4	U	0.997		**4.28**	
SW-013	A12 Lake in A12 Pit	5/21/2018		Pit Lake	On disturbance	Southern Part of North Limb	522		9	J	0.433		**1.07**	
SW-013	A12 Lake in A12 Pit	9/19/2018		Pit Lake	On disturbance	Southern Part of North Limb	473		< 4	U	0.510		**1.48**	
SW-014	Big Willow Springs	5/17/2018		Spring	On disturbance	Between South 40 and East Limb	443		5	J	0.148		**0.342**	
SW-014	Big Willow Springs	9/13/2018		Spring	On disturbance	Between South 40 and East Limb	440		< 4	U	0.169		**0.371**	
SW-015	Willow Creek (Upper Ross Fork Creek)	5/16/2018		Creek	Downgradient	South 40	526		343		0.130		**0.830**	
SW-015	Willow Creek (Upper Ross Fork Creek)	9/11/2018		Creek	Downgradient	South 40	556		< 11	U	0.251		**1.15**	
SW-016	Lake in JD/JF Pit	5/16/2018		Pit Lake	On disturbance	South 40	503		31		0.201		**1.52**	
SW-016	Lake in JD/JF Pit	9/12/2018		Pit Lake	On disturbance	South 40	473		< 4	U	0.288		**4.30**	
SW-018	Ross Fork Creek (downstream of Danielson Creek)	5/15/2018		Creek	On disturbance	West of South 40	85.7		1410		0.037	J	**1.07**	
SW-018	Ross Fork Creek (downstream of Danielson Creek)	9/12/2018		Creek	On disturbance	West of South 40	153		< 11	U	< 0.05	U	**1.62**	
SW-018	Ross Fork Creek (downstream of Danielson Creek)	9/12/2018	Duplicate	Creek	On disturbance	West of South 40	154		< 11	U	0.060		**1.55**	
SW-019	Ross Fork above the Narrows	5/15/2018		Creek	On disturbance	West of South 40	71.7		958		0.031	J	**0.517**	
SW-019	Ross Fork above the Narrows	9/12/2018		Creek	On disturbance	West of South 40	133		< 4	U	0.056		**0.966**	
SW-020	Big Springs (spring only)	5/16/2018		Spring	Upgradient	South of South 40	81.3		215		< 0.020	U	**0.396**	
SW-020	Big Springs (spring only)	9/12/2018		Spring	Upgradient	South of South 40	114		11		< 0.05	U	**0.569**	
SW-021	Jeff Cabin Creek(water source for Falkner Ranch)	5/18/2018		Creek	Upgradient	South of East Limb & SE of South 40	147		757		0.108		**2.2**	
SW-021	Jeff Cabin Creek(water source for Falkner Ranch)	9/18/2018		Creek	Upgradient	South of East Limb & SE of South 40	186		< 4	U	0.063		**2.84**	
SW-022	Lower Big Jimmy Creek Spring(area feeding into Portneuf River)	5/18/2018		Creek	Upgradient or Background	East of South 40	268		47		0.178		**3.7**	
SW-022	Lower Big Jimmy Creek Spring(area feeding into Portneuf River)	9/18/2018		Creek	Upgradient or Background	East of South 40	232		< 4	U	0.126		**0.950**	
SW-023	Portneuf River (downstream of Bakers Creek)	5/18/2018		River	Downgradient	East of East Limb	349		51		0.128		**1.45**	
SW-023	Portneuf River (downstream of Bakers Creek)	9/17/2018		River	Downgradient	East of East Limb	375		< 4	U	0.098		**1.78**	
SW-024A	Portneuf River (above Bakers Creek)	5/18/2018		River	Downgradient	East of East Limb	288		59		0.162		**1.22**	
SW-024A	Portneuf River (above Bakers Creek)	9/17/2018		River	Downgradient	East of East Limb	214		< 4	U	0.147		**1.71**	
SW-025	Z Pit Lake	5/17/2018		Pit Lake	On disturbance	East Limb	259		80		0.309		**0.546**	
SW-025	Z Pit Lake	9/14/2018		Pit Lake	On disturbance	East Limb	251		< 4	U	0.556		**1.71**	
SW-026	Queedup Springs(by Lone Pine Canyon Road)	5/17/2018		Spring	Downgradient	East of East Limb	595		< 3	U	0.022	J	**3.20**	
SW-026	Queedup Springs(by Lone Pine Canyon Road)	9/13/2018		Spring	Downgradient	East of East Limb	547		< 4	U	0.034	J	**2.99**	
SW-028	Lone Pine Spring(Y Spring South, along Lone Pine Road)	5/17/2018		Spring	Upgradient	East of East Limb	463		186		0.079		0.125	
SW-028	Lone Pine Spring(Y Spring South, along Lone Pine Road)	9/13/2018		Spring	Upgradient	East of East Limb	549		< 4	U	0.124		**0.461**	
SW-029	W Pit Lake	5/20/2018		Pit Lake	Downgradient	East Limb	340		12		0.309		**23**	
SW-029	W Pit Lake	9/14/2018		Pit Lake	Downgradient	East Limb	327		< 4	U	0.478		**57.5**	

Table 3.1-1: Surface Water Sampling Results – Dissolved Fraction

						Analyte	Hardness, Calcium Carbonate		Aluminum		Antimony		Arsenic	
						CAS #	HARDCA		7429-90-5		7440-36-0		7440-38-2	
						Analysis Method	SM2340B		SW6010C		SW6020		E1632A/SW6020	
						Ecological Screening Level	N/A		N/A		N/A		0.14	
						Units	mg/l		µg/L		µg/L		µg/L	
Site	**Site Description**	**Sample Date**	**Sample QC**	**Position**	**Waterbody Type**	**Area**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
SW-030	East Limb North Pond / Holding pond below Y intersection(above HH Pit)	5/20/2018		Pond	Upgradient*	West of East Limb	350		72		0.212		**0.762**	
SW-030	East Limb North Pond / Holding pond below Y intersection(above HH Pit)	9/14/2018		Pond	Upgradient*	West of East Limb	289		6	J	0.268		**1.00**	
SW-031	Portneuf River (above U Creek)	5/22/2018		River	Upgradient or Background	East of North Limb & NE East Limb	268		704		0.13		**0.716**	
SW-031	Portneuf River (above U Creek)	9/19/2018		River	Upgradient or Background	East of North Limb & NE East Limb	226		< 4	U	0.084		**0.533**	
SW-032	Red Rock Spring	5/22/2018		Spring	Upgradient or Background	East of North Limb	227		24		0.128		**0.439**	
SW-033	Mud Springs (north & east of mine, along road near Red Rock Spring)	5/22/2018		Spring	Upgradient or Background	East of North Limb	159		572		0.134		**2.04**	
SW-033	Mud Springs (north & east of mine, along road near Red Rock Spring)	9/19/2018		Spring	Upgradient or Background	East of North Limb	189		< 4	U	0.076		**2.12**	
SW-034	North Fork of Bakers Creek	5/18/2018		Creek	Downgradient	East of East Limb	483		< 3	U	0.135		**1.77**	
SW-034	North Fork of Bakers Creek	9/17/2018		Creek	Downgradient	East of East Limb	490		< 4	U	0.057		**1.45**	
SW-035	U Creek(above confluence with Portneuf River)	5/22/2018		Creek	Downgradient	East of North Limb	383		130		0.159		**0.662**	
SW-035	U Creek(above confluence with Portneuf River)	9/19/2018		Creek	Downgradient	East of North Limb	356		< 4	U	0.153		**0.644**	
SW-036	Seep and Pond below EE-2	5/17/2018		Spring	Downgradient	East Limb	378		47		0.128		**0.589**	
SW-036	Seep and Pond below EE-2	9/13/2018		Spring	Downgradient	East Limb	847		< 4	U	0.721		**1.36**	
SW-037	Willow Creek (Downstream of South 40 Area, upstream of Ross Fork Creek)	5/16/2018		Creek	Downgradient	South 40	495		25		0.123		**0.882**	
SW-037	Willow Creek (Downstream of South 40 Area, upstream of Ross Fork Creek)	5/16/2018	Duplicate	Creek	Downgradient	South 40	502		26		0.119		**0.888**	
SW-037	Willow Creek (Downstream of South 40 Area, upstream of Ross Fork Creek)	9/11/2018		Creek	Downgradient	West of South 40	464		< 4	U	0.348		**0.976**	
SW-038	Lincoln Peak Spring(Above and east of the M Pit area)	5/23/2018		Spring	Upgradient	East of North Limb	485		184		0.135		0.103	
SW-038	Lincoln Peak Spring(Above and east of the M Pit area)	9/20/2018		Spring	Upgradient	East of North Limb	461		< 4	U	0.116		**0.201**	
SW-039	Y Spring(Between SW-014 and SW-015)	5/16/2018		Spring	Downgradient	South 40	564		32		0.417		**1.32**	
SW-039	Y Spring(Between SW-014 and SW-015)	9/12/2018		Spring	Downgradient	South 40	590		< 4	U	0.398		**1.37**	
SW-040	Seep east of II-2 Overburden Disposal Area (OBDA)	5/20/2018		Spring	On or near disturbance	East Limb	552		29		0.135		**0.796**	
SW-040	Seep east of II-2 Overburden Disposal Area (OBDA)	8/27/2018		Spring	On or near disturbance	East Limb	556		< 4	U	0.062		**0.93**	
SW-040	Seep east of II-2 Overburden Disposal Area (OBDA)	9/13/2018		Spring	On or near disturbance	East Limb	546		< 4	U	0.075		**0.619**	
SW-041	Catch Basin northeast of II-2 OBDA	5/20/2018		Spring	On or near disturbance	East Limb	153		1760		2.96		**11.8**	
SW-042	Catch Basin northeast of AA-2 OBDA	5/20/2018		Spring	Downgradient	East Limb	128		3840		0.524		**2.18**	
SW-043	Spring east of AA-2 OBDA	5/20/2018		Spring	Downgradient	East Limb	533		52		0.115		**1.16**	
SW-043	Spring east of AA-2 OBDA	9/13/2018		Spring	Downgradient	East Limb	513		< 4	U	0.318		**6.97**	
SW-044	Seep Area above and northeast of W Pit	5/20/2018		Spring	On disturbance	East Limb	145		53		0.353		**1.42**	
SW-045	BB-2 North Spring and Pond	5/20/2018		Spring	On disturbance	East Limb	128		2460		1.14		**9.6**	
SW-045	BB-2 North Spring and Pond	5/20/2018	Duplicate	Spring	On disturbance	East Limb	123		2470		1.16		**9.05**	
SW-046	Pond on Lone Pine Road	5/20/2018		Spring	Downgradient	East Limb	439		22		0.171		**0.219**	
SW-047	Seep and Pond below FF-2	5/17/2018		Spring	Downgradient	East Limb	554		64		0.055		**0.217**	
SW-048	Spring box below OBDA 11, downstream of SW-040	5/20/2018		Spring	Downgradient	East Limb	520		224		0.167		**0.519**	
SW-048	Spring box below OBDA 11, downstream of SW-040	9/13/2018		Spring	Downgradient	East Limb	548		< 4	U	0.191		**2.01**	
SW-049	Lincoln Creek(downstream of Yandell and Warm Springs)	5/23/2018		Creek	Downgradient	Northwest of North Limb	367		118	J	0.08	J+	**2.24**	
SW-049	Lincoln Creek(downstream of Yandell and Warm Springs)	5/23/2018	Duplicate	Creek	Downgradient	Northwest of North Limb	368		88	J	0.086		**2.58**	
SW-049	Lincoln Creek(downstream of Yandell and Warm Springs)	9/20/2018		Creek	Downgradient	Northwest of North Limb	355		< 4	U	0.060		**2.60**	

Table 3.1-1: Surface Water Sampling Results – Dissolved Fraction

	Barium		Beryllium		Boron		Cadmium		Calcium		Chromium (Total)		Chromium (III)		Hexavalent Chromium		Cobalt	
	7440-39-3		7440-41-7		7440-42-8		7440-43-9		7440-70-2		7440-47-3		16065-83-1		18540-29-9		7440-48-4	
	SW6010C		SW6010C		SW6020		SW6020		SW6010C		SW6010C		DIFFERENCE CALC		E218.6		SW6010C/SW6020	
	4		0.66		1.6		0.25		116000		74		74		11		3	
	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Site	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
Blank	< 0.3	U	< 0.5	U	1.1	J	< 0.006	U	12	J	< 0.9	U	< 0.9	U	< 0.010	U	< 0.5	U
Blank	1.6	J	< 0.5	U	< 0.5	U	< 0.009	U	19	J	< 0.9	U	< 0.9	U	< 0.01	U	0.005	J
Blank	< 0.6	U	< 0.2	U	1.4	J	< 0.008	U	30		< 0.6	U	< 0.6	U	0.019	J	0.014	J
Blank	< 0.6	U	< 0.2	U	1.1	J	< 0.008	U	28		< 0.6	U	< 0.6	U	0.038		< 0.009	U
Blank	0.5	J	< 0.5	U	< 0.5	U	< 0.009	U	20	J	< 0.9	U	< 0.9	U	< 0.01	U	0.011	J
SW-002	**106**		< 0.5	U	**76.2**		**0.349**		85500		7.6		7.4	J	0.21	J	0.86	
SW-003	**54.7**		< 0.5	U	**92.7**		**1.22**		**172000**		1.9	J	1.8	J	0.064	J	0.708	
SW-003	**62.7**		< 0.2	U	**101**		0.082		**177000**		< 0.6	U	< 0.6	UJ	0.045	J	0.663	
SW-004A	**93.6**		< 0.5	U	**41.7**		0.074		53500		< 0.9	U	< 0.9	UJ	0.09	J	0.121	
SW-004A	**89.7**		< 0.2	U	**20.9**		0.020		74200		< 0.6	U	< 0.6	UJ	0.042	J	0.155	
SW-005	**157**		< 0.5	U	**32.7**		0.014	J	106000		< 0.9	U	< 0.9	UJ	0.124	J	0.056	
SW-006	**136**		< 0.5	U	**17.1**		< 0.009	U	83700		< 0.9	U	< 0.9	UJ	0.104	J	0.04	
SW-006	**133**		< 0.2	U	**17.7**		< 0.008	U	79700		< 0.6	U	< 0.6	UJ	0.140	J	0.053	
SW-007	**33.6**		< 0.5	U	**35.3**		< 0.009	U	89100		< 0.9	U	< 0.9	UJ	0.474	J	0.023	
SW-007	**32.3**		< 0.2	U	**36.3**		< 0.008	U	84100		< 0.6	U	< 0.6	UJ	0.556	J	0.050	
SW-007	**32.4**		< 0.2	U	**36.0**		< 0.008	U	85400		< 0.6	U	< 0.6	UJ	0.545	J	0.055	
SW-008	**55.4**		< 0.5	U	**54.5**		0.047		**129000**		< 0.9	U	< 0.9	UJ	0.096	J	0.176	
SW-008	**93.5**		< 0.2	U	**92**		< 0.008	U	90000		< 0.6	U	< 0.6	UJ	0.037	J	0.311	
SW-009	**81.3**		< 0.5	U	**104**		0.022		**150000**		< 0.9	U	< 0.9	U	0.114		0.05	
SW-010	**61.4**		< 0.5	U	**74.9**		0.02		**131000**		< 0.9	U	1.1	J	0.032		0.183	
SW-010	**72.7**		< 0.2	U	**114**		< 0.008	U	76200		< 0.6	U	< 0.6	U	< 0.010	U	0.343	
SW-011	**51.3**		< 0.5	U	**75**		0.019	J	**120000**		< 0.9	U	< 0.9	U	0.034		0.159	
SW-011	**59.2**		< 0.2	U	**117**		< 0.008	U	67300		< 0.6	U	< 0.6	U	< 0.02	UJ	0.194	
SW-012	**47.3**		< 0.5	U	**76.4**		0.096		**122000**		< 0.9	U	1.1	J	0.036		0.158	
SW-012	**188**		< 0.2	U	**181**		0.024		101000		< 0.6	U	< 0.6	UJ	0.044	J+	0.445	
SW-013	**64.6**		< 0.5	U	**75**		**1.74**		**137000**		< 0.9	U	< 0.9	U	0.915		0.097	
SW-013	**60.4**		< 0.2	U	**150**		0.041		104000		< 0.6	U	< 0.6	UJ	0.728	J	0.113	
SW-014	**149**		< 0.5	U	**48.1**		0.098		**133000**		< 0.9	U	< 0.9	UJ	0.134	J	< 0.5	U
SW-014	**145**		< 0.2	U	**53.4**		0.099		**129000**		< 0.6	U	< 0.6	UJ	0.182	J	0.063	
SW-015	**135**		< 0.5	U	**45.5**		0.026		**152000**		< 0.9	U	< 0.9	UJ	0.046	J	0.207	
SW-015	**154**		< 0.2	U	**68.9**		< 0.008	U	**153000**		< 0.6	U	< 0.6	UJ	0.046	J	0.364	
SW-016	**107**		< 0.5	U	**57.3**		**1.50**		**130000**		1.2	J	< 0.9	UJ	0.999	J	0.063	
SW-016	**98.8**		< 0.2	U	**65.7**		**0.314**		107000		< 0.6	U	< 0.6	UJ	0.196	J	0.114	
SW-018	**53.1**		< 0.5	U	**11.3**		0.046		23300		1.4	J	1.3	J	0.053	J	0.522	
SW-018	**63.3**		< 0.2	U	**13.5**		< 0.008	U	38600		< 0.6	U	< 0.6	UJ	0.104	J	0.081	J
SW-018	**63.4**		< 0.2	U	**11.5**		< 0.008	U	38900		< 0.6	U	< 0.6	UJ	0.108	J	0.122	J
SW-019	**38.9**		< 0.5	U	**9.2**		0.020		19400		< 0.9	U	< 0.9	U	0.083	J	0.294	
SW-019	**48.2**		< 0.2	U	**10.3**		< 0.008	U	33300		< 0.6	U	< 0.6	UJ	0.147	J	0.084	
SW-020	**33.2**		< 0.5	U	**8.0**		< 0.006	U	21800		< 0.9	U	< 0.9	UJ	0.132	J	0.062	
SW-020	**40.6**		< 0.2	U	**8.5**		< 0.008	U	27600		< 0.6	U	< 0.6	UJ	0.189	J	0.048	
SW-021	**49.8**		< 0.5	U	**14.8**		0.014	J	36700		< 0.9	U	< 0.9	U	0.185	J+	0.136	
SW-021	**52.3**		< 0.2	U	**13.3**		< 0.008	U	44400		< 0.6	U	< 0.6	UJ	0.288	J	0.073	
SW-022	**175**		< 0.5	U	**31.7**		0.013	J	81700		< 0.9	U	< 0.9	UJ	< 0.01	UJ	0.421	
SW-022	**122**		< 0.2	U	**22.4**		< 0.008	U	65200		< 0.6	U	< 0.6	UJ	0.033	J	0.233	
SW-023	**90.4**		< 0.5	U	**46.4**		0.006	J	86500		< 0.9	U	1.1	J	0.049	J	0.092	
SW-023	**64.4**		< 0.2	U	**68.9**		< 0.008	U	75800		< 0.6	U	< 0.6	UJ	0.106	J	0.061	J
SW-024A	**113**		< 0.5	U	**34.4**		0.011	J	83500		< 0.9	U	< 0.9	UJ	0.038	J+	0.112	
SW-024A	**120**		< 0.2	U	**37.5**		< 0.008	U	59200		< 0.6	U	< 0.6	UJ	0.157	J	0.116	
SW-025	**38.9**		< 0.5	U	**57.6**		**0.272**		42500		< 0.9	U	< 0.9	U	0.271		< 0.5	U
SW-025	**33.8**		< 0.2	U	**79.5**		0.048		27500		< 0.6	U	< 0.6	U	0.365	J+	0.134	
SW-026	**28.8**		< 0.5	U	**61.9**		0.174		**156000**		< 0.9	U	< 0.9	UJ	0.444	J	< 0.5	U
SW-026	**27.5**		< 0.2	U	**61.8**		0.172		**136000**		< 0.6	U	< 0.6	UJ	1.65	J	0.029	J
SW-028	**120**		< 0.5	U	**29.9**		0.009	J	**142000**		< 0.9	U	< 0.9	UJ	0.113	J	< 0.5	U
SW-028	**147**		< 0.2	U	**41.5**		< 0.008	U	**165000**		< 0.6	U	< 0.6	UJ	0.062	J	0.326	
SW-029	**23.9**		< 0.5	U	**73.8**		0.045		63900		< 0.9	U	< 0.9	U	0.056		0.182	
SW-029	**46.7**		< 0.2	U	**68.2**		0.018	J	24500		< 0.6	U	< 0.6	U	0.075	J+	0.228	

Table 3.1-1: Surface Water Sampling Results – Dissolved Fraction

	Barium 7440-39-3 SW6010C 4 µg/L		Beryllium 7440-41-7 SW6010C 0.66 µg/L		Boron 7440-42-8 SW6020 1.6 µg/L		Cadmium 7440-43-9 SW6020 0.25 µg/L		Calcium 7440-70-2 SW6010C 116000 µg/L		Chromium (Total) 7440-47-3 SW6010C 74 µg/L		Chromium (III) 16065-83-1 DIFFERENCE CALC 74 µg/L		Hexavalent Chromium 18540-29-9 E218.6 11 µg/L		Cobalt 7440-48-4 SW6010C/SW6020 3 µg/L	
Site	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
SW-030	**45.9**		< 0.5	U	**68.9**		0.013	J	93200		< 0.9	U	1.4	J	< 0.01	U	0.23	
SW-030	**86.6**		< 0.2	U	**103**		< 0.008	U	50600		< 0.6	U	< 0.6	UJ	0.054	J	0.444	
SW-031	**109**		< 0.5	U	**28**		0.03		80600		1.2	J	1.1	J	0.101	J+	0.319	
SW-031	**74.6**		< 0.2	U	**24.2**		< 0.008	U	66000		< 0.6	U	< 0.6	UJ	0.200	J	0.144	
SW-032	**66.4**		< 0.5	U	**29.2**		0.011	J	61000		< 0.9	U	< 0.9	UJ	0.03	J	0.086	
SW-033	**62.5**		< 0.5	U	**35.7**		0.023		45300		0.9	J	0.9	J	< 0.01	UJ	0.813	
SW-033	**64.3**		< 0.2	U	**43.3**		< 0.008	U	52400		< 0.6	U	< 0.6	UJ	0.052	J	0.083	
SW-034	**40.8**		< 0.5	U	**71.7**		0.009	J	101000		< 0.9	U	< 0.9	UJ	0.033	J	0.078	
SW-034	**26.9**		< 0.2	U	**89.0**		< 0.008	U	90000		< 0.6	U	< 0.6	UJ	0.058	J	0.054	
SW-035	**104**		< 0.5	U	**36.1**		0.014	J	111000		< 0.9	U	< 0.9	UJ	0.049	J+	0.158	
SW-035	**119**		< 0.2	U	**32.0**		< 0.008	U	102000		< 0.6	U	< 0.6	UJ	0.041	J	0.182	
SW-036	**71.0**		< 0.5	U	**68.8**		0.010	J	94300		< 0.9	U	< 0.9	UJ	0.034	J	< 0.5	U
SW-036	**530**		< 0.2	U	**219**		0.008	J	**171000**		< 0.6	U	< 0.6	UJ	0.042	J	1.93	
SW-037	**115**		< 0.5	U	**43.3**		0.007	J	**139000**		< 0.9	U	< 0.9	UJ	0.039	J	0.050	
SW-037	**117**		< 0.5	U	**42.2**		0.006	J	**142000**		< 0.9	U	< 0.9	UJ	0.037	J	0.043	
SW-037	**127**		< 0.2	U	**67.9**		< 0.008	U	113000		< 0.6	U	< 0.6	UJ	0.058	J	0.139	
SW-038	**96.9**		< 0.5	U	**43.9**		0.009	J	**148000**		< 0.9	U	< 0.9	UJ	0.135	J	0.094	
SW-038	**91.2**		< 0.2	U	**37.8**		< 0.008	U	**140000**		< 0.6	U	< 0.6	UJ	0.122	J	0.126	
SW-039	**171**		< 0.5	U	**64.8**		0.045		**169000**		< 0.9	U	< 0.9	UJ	0.095	J	0.107	
SW-039	**143**		< 0.2	U	**73.7**		0.019	J	**171000**		< 0.6	U	< 0.6	UJ	0.055	J	0.218	
SW-040	**79.9**		< 0.5	U	**109**		**1.31**		**139000**		< 0.9	U	1	J	2.25	J+	0.088	
SW-040	**87.2**		< 0.2	U	**115**		**0.945**		**135000**		0.8	J	< 0.6	U	0.985		0.064	
SW-040	**83.4**		< 0.2	U	**125**		**0.716**		**130000**		< 0.6	U	< 0.6	UJ	2.69	J	0.060	
SW-041	**81.8**		< 0.5	U	**51**		**5.42**		47200		**79.5**		**79.3**		0.159	J+	1.74	
SW-042	**97.3**		< 0.5	U	**53.7**		**0.867**		32800		12.1		12.1		0.037	J+	2.53	
SW-043	**82.7**		< 0.5	U	**63.5**		0.026		**148000**		< 0.9	U	1.1	J	0.178	J+	0.297	
SW-043	**176**		< 0.2	U	**79.2**		0.008	J	**131000**		< 0.6	U	< 0.6	UJ	0.023	J	1.66	
SW-044	**13.3**		< 0.5	U	**99.8**		**0.36**		36600		< 0.9	U	2.6	J	0.144	J+	0.35	
SW-045	**45.6**		< 0.5	U	**41.7**		**5.65**		38800		**89.1**		**78.8**		0.311	J+	1.74	
SW-045	**43.8**		< 0.5	U	**42.2**		**5.75**		37200		**89.3**		**89**		0.308	J+	1.77	
SW-046	**104**		< 0.5	U	**30.7**		0.078		**132000**		< 0.9	U	1.5	J	0.15	J+	0.066	
SW-047	**72.7**		< 0.5	U	**42.5**		0.009	J	**161000**		< 0.9	U	< 0.9	UJ	0.170	J	< 0.5	U
SW-048	**78.1**		< 0.5	U	**128**		0.03		**130000**		< 0.9	U	1.2	J	0.629	J+	0.183	
SW-048	**113**		< 0.2	U	**152**		< 0.008	U	**122000**		< 0.6	U	< 0.6	UJ	0.051	J	0.524	
SW-049	**39.5**		< 0.5	U	**39.9**		< 0.009	U	97200		< 0.9	U	< 0.9	UJ	0.576	J	0.065	
SW-049	**39.6**		< 0.5	U	**39.6**		< 0.009	U	97000		< 0.9	U	< 0.9	UJ	0.586	J	0.065	
SW-049	**38.7**		< 0.2	U	**37.0**		< 0.008	U	94400		< 0.6	U	< 0.6	UJ	0.643	J	0.043	

Table 3.1-1: Surface Water Sampling Results – Dissolved Fraction

	Copper		Iron		Lead		Magnesium		Manganese		Mercury		Molybdenum		Nickel		Phosphorus		Potassium		Selenium	
	7440-50-8		7439-89-6		7439-92-1		7439-95-4		7439-96-5		7439-97-6		7439-98-7		7440-02-0		7723-14-0		7440-09-7		7782-49-2	
	SW6010C		SW6010C		SW6020		SW6010C		SW6010C		SW7470		SW6010C		SW6010C		SW6010C/E365.3		SW6010C		SW6020	
	9		N/A		2.5		82000		120		N/A		N/A		52		N/A		53000		1.5/3.1 [2]	
	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Site	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	Result	Qualifier
Blank	< 2.1	U	< 3	U	0.006	J	2.2	J	< 0.3	U	< 0.02	U	< 0.9	U	< 0.9	U	20	J	60	J	< 0.2	U
Blank	< 2.1	U	7	J	< 0.007	U	3.6	J	< 0.3	U	< 0.02	U	3.4	J	< 0.9	U	10	J	< 50	U	< 0.2	U
Blank	< 0.9	U	4	J	0.008	J	7	J	0.1	J	< 0.02	U	< 0.5	U	< 0.4	U	25	J	< 60	U	< 0.2	U
Blank	< 0.9	U	4	J	< 0.006	U	10.5		0.1	J	< 0.02	U	< 0.5	U	< 0.4	U	13	J	< 60	U	< 0.2	U
Blank	< 2.1	U	8	J	< 0.007	U	8.9		< 0.3	U	< 0.02	U	< 0.9	U	< 0.9	U	8	J	< 50	U	< 0.2	U
SW-002	5.4		3060		1.61		43000		84.2		< 0.02	U	2.9	J	5.6		367		3200		**2.9**	
SW-003	< 2.1	U	322		0.077		56100		**219**		< 0.02	U	110		45.3		198		4360		**52.4**	
SW-003	< 0.9	U	26		< 0.006	U	**115000**		**441**		< 0.02	U	110		32.6		79		9030		**18.1**	
SW-004A	< 2.1	U	82		0.063		12900		33.9		< 0.02	U	2.4	J	1.9	J	62		840		**4.8**	
SW-004A	< 0.9	U	15	J	< 0.04	U	18500		17.5		< 0.02	U	< 4.2	U	4.0	J	111		8380		**2.9**	
SW-005	< 2.1	U	58		0.034		15900		6.6		< 0.02	U	1.2	J	< 0.9	U	< 6	U	950		1.1	
SW-006	< 2.1	U	47		0.027		9250		2.4		< 0.02	U	< 0.9	U	< 0.9	U	< 6	U	820		0.4	J
SW-006	< 0.9	U	11	J	0.027	J	9250		< 1.1	U	< 0.02	U	< 0.5	U	< 0.4	U	< 42	U	880		0.4	J
SW-007	< 2.1	U	< 3	U	0.007	J	22800		1.4		< 0.02	U	< 0.9	U	< 0.9	U	< 6	U	890		0.7	J
SW-007	< 0.9	U	11	J	0.015	J	22700		30.0		< 0.02	U	< 0.5	U	< 0.4	U	46		900		0.5	J
SW-007	< 0.9	U	11	J	< 0.04	U	22400		33.9		< 0.02	U	< 0.5	U	< 0.4	U	45		890		0.5	J
SW-008	< 2.1	U	167		0.109		27600		77.6		< 0.02	U	1.6	J	1.2	J	< 6	U	1310		2.1	
SW-008	< 0.9	U	122		0.059		36100		**125**		< 0.02	U	4.8		5.6		104		13700		0.8	J
SW-009	< 2.1	U	< 3	U	< 0.004	U	40000		< 0.3	U	< 0.02	U	2.5	J	< 0.9	U	50		1680		3	
SW-010	< 2.1	U	33		0.036		38700		**231**		< 0.02	U	8.5		< 0.9	U	58		2080		**3.3**	
SW-010	< 0.9	U	13	J	0.041		49600		81.6		< 0.02	U	6.2		0.7	J	< 42	U	2680		0.6	J
SW-011	< 2.1	U	50		< 0.004	U	42500		**244**		< 0.02	U	5.8		< 0.9	U	67		2210		**2.4**	
SW-011	< 0.9	U	11	J	< 0.04	U	58600		14.3		< 0.02	U	4.7		0.4	J	< 42	U	1690		0.6	J
SW-012	< 2.1	U	91		0.052		41500		**142**		< 0.02	U	5.8		< 0.9	U	89		2190		**2.7**	
SW-012	< 0.9	U	63		< 0.04	U	76200		**1010**		< 0.02	U	15.0		11.2		328		16600		**2.6**	
SW-013	< 2.1	U	< 3	U	< 0.004	U	43800		13.5		< 0.02	U	23.6		16.8		< 6	U	2480		**86.1**	
SW-013	< 0.9	U	4	J	< 0.006	U	51800		4.7		< 0.02	U	24.5		8.5		< 42	U	2710		**81.7**	
SW-014	< 2.1	U	<12	U	< 0.010	U	27000		< 0.3	U	< 0.02	U	1.7	J	< 0.9	U	63		1300		2.7	
SW-014	< 0.9	U	9	J	0.016	J	28700		0.07	J	< 0.02	U	7.9		< 0.4	U	61		1270		2.6	
SW-015	< 2.1	U	345		0.236		35600		43.3		< 0.02	U	1.8	J	< 0.9	U	66		1880		**2.7**	
SW-015	< 0.9	U	7	J	0.035		42300		97.1		< 0.02	U	7.5		< 0.4	U	46		3550		1.2	
SW-016	< 2.1	U	47		0.041		43400		10.4		< 0.02	U	3.7	J	5.3		99		1970		**69.9**	
SW-016	< 0.9	U	4	J	0.009	J	50000		5.1		< 0.02	U	7.1		3.5	J	101		2560		**24.2**	
SW-018	2.2	J	1340		1.12		6690		38.9		< 0.02	U	< 0.9	U	1.2	J	84		910		< 0.2	U
SW-018	< 0.9	U	16	J	0.016	J	13700		14.9		< 0.02	U	< 4.2	U	< 0.4	U	< 42	U	770		< 0.2	U
SW-018	< 0.9	U	18	J	0.011	J	13900		15.0		< 0.02	U	< 4.2	U	< 0.4	U	< 42	U	790		< 0.2	U
SW-019	< 2.1	U	872		0.681		5660		19.0		< 0.02	U	< 0.9	U	0.9	J	53		710		< 0.2	U
SW-019	< 0.9	U	< 3	U	0.006	J	12200		< 1.1	U	< 0.02	U	< 0.5	U	< 0.4	U	< 42	U	610		< 0.2	U
SW-020	< 2.1	U	212		0.161		6530		3.3		< 0.02	U	< 0.9	U	< 0.9	U	< 22	U	380		< 0.2	U
SW-020	< 0.9	U	5	J	0.021		11000		< 1.1	U	< 0.02	U	< 0.5	U	< 0.4	U	< 42	U	450		< 0.2	U
SW-021	< 2.1	U	512		0.299		13400		7.5		< 0.02	U	< 0.9	U	< 0.9	U	54		860		< 0.2	U
SW-021	< 0.9	U	9	J	< 0.04	U	18200		2.4		< 0.02	U	5.7		< 0.4	U	< 42	U	750		< 0.2	U
SW-022	< 2.1	U	333		0.054		15600		11.4		< 0.02	U	< 0.9	U	0.9	J	90		1830		0.4	J
SW-022	< 0.9	U	9	J	< 0.04	U	16900		5.4		< 0.02	U	< 4.2	U	< 0.4	U	< 42	U	2490		< 0.2	U
SW-023	< 2.1	U	68		0.053		32200		42.3		< 0.02	U	< 0.9	U	< 0.9	U	80		8700		0.4	J
SW-023	< 0.9	U	6	J	< 0.02	U	45100		9.8		< 0.02	U	< 4.2	U	< 0.4	U	< 42	U	16600		0.7	J
SW-024A	< 2.1	U	76		0.061		19300		38.5		< 0.02	U	< 0.9	U	< 0.9	U	96		2430		0.3	J
SW-024A	< 0.9	U	5	J	0.024		16000		11.7		< 0.02	U	< 4.2	U	< 0.4	U	< 42	U	4620		0.4	J
SW-025	< 2.1	U	162		0.070		37200		28.7		< 0.02	U	24.4		7.6		44		6610		**26.2**	
SW-025	< 0.9	U	< 3	U	< 0.02	U	44300		1.6		< 0.02	U	28.9		5.4		< 42	U	7890		**29.8**	
SW-026	< 2.1	U	< 3	U	< 0.010	U	49800		< 0.3	U	< 0.02	U	1.6	J	1.5	J	< 28	U	18500		**8.1**	
SW-026	< 0.9	U	6	J	< 0.006	U	50300		< 0.07	U	< 0.02	U	< 4.2	U	2.0	J	< 42	U	17100		**8.8**	
SW-028	< 2.1	U	167		0.104		26300		10.2		< 0.02	U	1.5	J	< 0.9	U	49		1230		1.7	
SW-028	< 0.9	U	9	J	0.009	J	33200		**328**		< 0.02	U	< 4.2	U	< 0.4	U	64		1420		0.5	J
SW-029	< 2.1	U	89		0.026		43900		**217**		< 0.02	U	6.5		4	J	79		19500		1.4	
SW-029	< 0.9	U	7	J	< 0.02	U	64600		54.1		< 0.02	U	4.6		3.4	J	< 42	U	26900		0.8	J

Table 3.1-1: Surface Water Sampling Results – Dissolved Fraction

	Copper 7440-50-8 SW6010C 9 µg/L		Iron 7439-89-6 SW6010C N/A µg/L		Lead 7439-92-1 SW6020 2.5 µg/L		Magnesium 7439-95-4 SW6010C 82000 µg/L		Manganese 7439-96-5 SW6010C 120 µg/L		Mercury 7439-97-6 SW7470 N/A µg/L		Molybdenum 7439-98-7 SW6010C N/A µg/L		Nickel 7440-02-0 SW6010C 52 µg/L		Phosphorus 7723-14-0 SW6010C/E365.3 N/A µg/L		Potassium 7440-09-7 SW6010C 53000 µg/L		Selenium 7782-49-2 SW6020 1.5/3.1 [2] µg/L	
Site	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	Result	Qualifier
SW-030	< 2.1	U	81		0.083		28400		81.1		< 0.02	U	< 0.9	U	< 0.9	U	223		6230		0.4	J
SW-030	< 0.9	U	16	J	0.053		39400		72.1		< 0.02	U	< 4.2	U	0.6	J	148		7510		0.3	J
SW-031	< 2.1	U	803		0.483		16100		39.2		< 0.02	U	< 0.9	U	0.9	J	134		1510		0.5	J
SW-031	< 0.9	U	9	J	0.012	J	14900		11.2		< 0.02	U	< 4.2	U	< 0.4	U	53		1330		0.3	J
SW-032	< 2.1	U	25		0.018	J	18100		0.6	J	< 0.02	U	< 0.9	U	< 0.9	U	26	J	320		0.2	J
SW-033	< 2.1	U	658		0.371		11200		**120**		< 0.02	U	< 0.9	U	1.1	J	83		470		< 0.2	U
SW-033	< 0.9	U	31		0.008	J	14200		6.7		< 0.02	U	< 0.5	U	< 0.4	U	62		560		< 0.2	U
SW-034	< 2.1	U	< 3	U	0.018	J	56000		13.9		< 0.02	U	4.5		< 0.9	U	48		20400		0.8	J
SW-034	< 0.9	U	5	J	< 0.02	U	64400		< 0.07	U	< 0.02	U	7.1	J	< 0.4	U	< 42	U	24700		1.0	
SW-035	< 2.1	U	144		0.105		25700		53.4		< 0.02	U	1.3	J	< 0.9	U	70		1260		0.6	J
SW-035	< 0.9	U	7	J	< 0.04	U	24700		60.4		< 0.02	U	< 4.2	U	< 0.4	U	44		1640		0.5	J
SW-036	< 2.1	U	81		0.044		34700		**193**		< 0.02	U	2.2	J	1.8	J	80		7680		0.4	J
SW-036	< 0.9	U	63		0.022		**102000**		**13600**		< 0.02	U	10.1		9.8		118		31500		0.8	J
SW-037	< 2.1	U	23		0.027		35800		0.4	J	0.02	J	1.6	J	< 0.9	U	< 16	U	1680		**2.5**	
SW-037	< 2.1	U	23		0.025		35900		< 0.3	U	< 0.02	U	1.9	J	< 0.9	U	< 15	U	1690		**2.4**	
SW-037	< 0.9	U	8	J	0.011	J	44200		< 0.07	U	< 0.02	U	< 4.2	U	< 0.4	U	< 42	U	2720		0.6	J
SW-038	< 2.1	U	152		0.098		28000		10.7		< 0.02	U	2.3	J	< 0.9	U	< 6	U	1240		**3.8**	
SW-038	< 0.9	U	13	J	< 0.04	U	27100		93.1		< 0.02	U	< 4.2	U	< 0.4	U	< 42	U	1230		**3.3**	
SW-039	< 2.1	U	36		0.028		34600		37.2		< 0.02	U	5.5		< 0.9	U	158		3260		**3.2**	
SW-039	< 0.9	U	21	J	0.017	J	39500		**126**		< 0.02	U	5.0		< 0.4	U	95		3240		**3.5**	
SW-040	< 2.1	U	84		0.06		49800		1.3		< 0.02	U	< 0.9	U	3.4	J	198		2860		**47.7**	
SW-040	< 0.9	U	< 3	U	< 0.02	U	53200		< 0.07	U	< 0.02	U	5.8		1.9	J	31		3020		**63.7**	
SW-040	< 0.9	U	< 21	U	< 0.006	U	53700		< 1.1	U	< 0.02	U	< 4.2	U	1.4	J	44		2990		**62.1**	
SW-041	**37.4**		3030		2.12		8530		**676**		0.15	J	45.2		**73.8**		2370		19800		1.9	
SW-042	8.4		3830		1.87		11200		**1800**		< 0.02	U	15.1		16.6		698		13000		0.8	J
SW-043	< 2.1	U	77		0.055		39800		**314**		< 0.02	U	< 0.9	U	< 0.9	U	181		3250		2.3	
SW-043	< 0.9	U	81		0.020	J	45100		**3790**		< 0.02	U	< 4.2	U	2.9	J	128		3860		2.0	
SW-044	2.8	J	237		0.076		12900		26.8		< 0.02	U	14.5		9.5		230		370		2	
SW-045	**37**		4180		1.94		7640		**137**		0.16	J	22.7		**72**		2960		17100		2.3	
SW-045	**36.3**		4030		1.96		7350		**135**		0.17	J	22.3		**69.3**		2850		16800		2.3	
SW-046	< 2.1	U	34		0.024		26500		13.2		< 0.02	U	< 0.9	U	< 0.9	U	34	J	1180		1.6	
SW-047	< 2.1	U	58		0.057		37000		48.8		< 0.02	U	< 0.9	U	< 0.9	U	54		1320		0.9	J
SW-048	< 2.1	U	211		0.14		47400		36.1		< 0.02	U	< 0.9	U	< 0.9	U	57		780		**42.8**	
SW-048	< 0.9	U	15	J	0.029		59100		**551**		< 0.02	U	< 4.2	U	1.1	J	120		3660		**29.3**	
SW-049	< 2.1	U	112	J	0.082		30100		7.7		< 0.02	U	1.9	J	< 0.9	U	< 6	U	4920		**2.2**	
SW-049	< 2.1	U	86	J	0.1		30500		7.7		< 0.02	U	2.6	J	< 0.9	U	< 6	U	4930		**2.2**	
SW-049	< 0.9	U	5	J	< 0.04	U	29000		3.1		< 0.02	U	< 4.2	U	< 0.4	U	< 42	U	4590		**2.1**	

Table 3.1-1: Surface Water Sampling Results – Dissolved Fraction

	Silver		Sodium		Thallium		Uranium		Vanadium		Zinc	
	7440-22-4		7440-23-5		7440-28-0		7440-61-1		7440-62-2		7440-66-6	
	SW6020		SW6010C		SW6020		SW6020		SW6010C		SW6010C	
	0.34		680000		N/A		2.6		15		100	
	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Site	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
Blank	< 0.008	U	< 20	U	< 0.008	U	< 0.006	U	< 1.1	U	0.6	J
Blank	< 0.002	U	< 20	U	< 0.008	U	< 0.005	U	< 1.1	U	< 0.6	U
Blank	< 0.009	U	40	J	< 0.009	U	< 0.008	U	< 0.5	U	< 0.4	U
Blank	< 0.009	U	30	J	< 0.009	U	< 0.008	U	< 0.5	U	< 0.4	U
Blank	< 0.002	U	< 20	U	< 0.008	U	< 0.005	U	< 1.1	U	< 0.6	U
SW-002	0.042		41800		0.052		2.18		**19.2**		28.4	
SW-003	0.037		51500		0.085		**22.6**		12.6		40.8	
SW-003	< 0.009	U	145000		< 0.02	U	**8.47**		**20.7**		2.8	J
SW-004A	0.007	J	14000		< 0.008	U	0.839		3.8	J	1.2	J
SW-004A	< 0.009	U	20600		< 0.009	U	0.489		3.2	J	< 4.2	U
SW-005	< 0.002	U	18400		< 0.008	U	0.948		< 1.1	U	< 0.6	U
SW-006	< 0.002	U	9350		< 0.008	U	0.654		< 1.1	U	0.6	J
SW-006	< 0.009	U	9470		< 0.009	U	0.638		0.6	J	< 0.4	U
SW-007	< 0.002	U	21100		< 0.008	U	0.62		1.4	J	< 0.6	U
SW-007	< 0.009	U	21000		< 0.009	U	0.621		0.5	J	< 0.4	U
SW-007	< 0.009	U	20600		< 0.009	U	0.622		< 0.5	U	< 4.2	U
SW-008	0.003	J	35000		< 0.008	U	1.58		1.5	J	1.8	J
SW-008	< 0.009	U	49200		< 0.009	U	0.780		2.2	J	0.8	J
SW-009	< 0.008	U	86600		0.016	J	**5.64**		< 1.1	U	1.1	J
SW-010	< 0.008	U	64100		< 0.008	U	**4.25**		< 1.1	U	0.7	J
SW-010	< 0.02	U	86500		< 0.02	U	2.43		3.7	J	< 4.2	U
SW-011	< 0.008	U	67000		< 0.008	U	**3.85**		< 1.1	U	1.2	J
SW-011	< 0.009	U	88300		< 0.009	U	1.27		2.5	J	< 4.2	U
SW-012	0.01	J	65600		< 0.008	U	**3.85**		< 1.1	U	2.1	J
SW-012	< 0.009	U	125000		< 0.009	U	**7.51**		12.9		< 4.2	U
SW-013	< 0.008	U	59500		0.093		**7.4**		**32.8**		35.1	
SW-013	< 0.009	U	70900		0.061		**7.52**		**27.5**		< 4.2	U
SW-014	< 0.008	U	46800		< 0.014	U	1.77		< 1.6	U	2.4	J
SW-014	< 0.009	U	53000		0.037		1.77		0.7	J	2.0	J
SW-015	< 0.008	U	36200		< 0.008	U	1.87		4.2		2.1	J
SW-015	< 0.02	U	43100		0.026		1.63		3.4	J	< 0.4	U
SW-016	0.064		41000		0.138		**9.50**		**19.8**		5.3	
SW-016	< 0.02	U	48600		0.121		**8.42**		14.0		0.5	J
SW-018	0.010	J	5100		0.021		0.303		2.3	J	5.8	
SW-018	< 0.009	U	10100		< 0.009	U	0.531		0.9	J	< 0.4	U
SW-018	< 0.009	U	10300		< 0.009	U	0.488		0.6	J	< 0.4	U
SW-019	< 0.008	U	3570		0.012	J	0.182		1.6	J	3.2	J
SW-019	< 0.009	U	6390		< 0.009	U	0.327		< 0.5	U	< 0.4	U
SW-020	< 0.008	U	2690		< 0.008	U	0.130		1.1	J	< 0.6	U
SW-020	< 0.009	U	4040		< 0.009	U	0.316		< 0.5	U	< 0.4	U
SW-021	0.009	J	6420		0.078		0.398		2.6	J	2.6	J
SW-021	< 0.02	U	7490		0.067		0.435		1.2	J	< 4.2	U
SW-022	< 0.008	U	17000		< 0.008	U	0.45		1.6	J	0.7	J
SW-022	< 0.009	U	14300		< 0.02	U	1.08		2.6	J	< 4.2	U
SW-023	< 0.008	U	25600		< 0.008	U	1.07		1.9	J	0.7	J
SW-023	< 0.009	U	28600		< 0.009	U	1.25		2.1	J	0.5	J
SW-024A	< 0.008	U	19900		< 0.008	U	0.968		2.7	J	< 0.6	U
SW-024A	< 0.009	U	19300		< 0.02	U	1.48		3.5	J	0.5	J
SW-025	0.010	J	27400		0.093		**3.13**		6.5		4.3	
SW-025	< 0.009	U	35300		0.071		2.67		11.6		0.8	J
SW-026	< 0.008	U	23600		0.096		1.14		< 2.5	U	18.4	
SW-026	< 0.009	U	23600		0.115		1.21		2.3	J	20.5	
SW-028	< 0.008	U	29900		< 0.008	U	0.871		< 1.1	U	1.3	J
SW-028	< 0.009	U	36600		< 0.009	U	0.886		1.6	J	< 0.4	U
SW-029	< 0.008	U	18800		< 0.008	U	1.77		3.2	J	1.5	J
SW-029	< 0.009	U	31100		< 0.009	U	1.30		5.9		0.7	J

Table 3.1-1: Surface Water Sampling Results – Dissolved Fraction

	Silver		Sodium		Thallium		Uranium		Vanadium		Zinc	
	7440-22-4		7440-23-5		7440-28-0		7440-61-1		7440-62-2		7440-66-6	
	SW6020		SW6010C		SW6020		SW6020		SW6010C		SW6010C	
	0.34		680000		N/A		2.6		15		100	
	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Site	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
SW-030	< 0.008	U	46900		< 0.008	U	0.816		2	J	< 0.6	U
SW-030	< 0.009	U	73500		< 0.009	U	0.739		3.4	J	0.7	J
SW-031	< 0.008	U	14800		0.008	J	0.838		3.3	J	3.5	J
SW-031	< 0.009	U	12900		< 0.009	U	0.748		2.1	J	< 0.4	U
SW-032	< 0.008	U	15700		< 0.008	U	0.818		1.5	J	0.7	J
SW-033	< 0.008	U	11100		< 0.008	U	0.287		4	J	4.2	
SW-033	< 0.009	U	13600		< 0.009	U	0.450		3.8	J	< 0.4	U
SW-034	< 0.008	U	33700		< 0.008	U	1.19		2.6	J	1.3	J
SW-034	< 0.009	U	35200		0.032	J	0.991		1.3	J	< 0.4	U
SW-035	< 0.008	U	26700		< 0.008	U	1.18		2	J	1.2	J
SW-035	< 0.009	U	22000		< 0.009	U	1.21		1.9	J	< 4.2	U
SW-036	< 0.008	U	45900		< 0.008	U	1.45		< 1.8	U	0.6	J
SW-036	< 0.009	U	262000		< 0.009	U	1.52		**20.2**		0.5	J
SW-037	< 0.008	U	36300		< 0.008	U	1.80		2.2	J	0.6	J
SW-037	< 0.008	U	36300		< 0.008	U	1.83		2.3	J	< 0.6	U
SW-037	< 0.009	U	46400		< 0.02	U	1.56		3.4	J	0.5	J
SW-038	< 0.002	U	34000		< 0.008	U	2.17		< 1.1	U	0.7	J
SW-038	< 0.009	U	32100		< 0.009	U	2.18		0.8	J	0.4	J
SW-039	< 0.008	U	38500		< 0.008	U	**3.40**		3.6	J	1.1	J
SW-039	< 0.009	U	44700		< 0.009	U	**3.60**		4.0	J	0.4	J
SW-040	0.038		65900		0.03		**5.11**		3.7	J	16.2	
SW-040	< 0.02	U	73900		0.026		**5.13**		1.9	J	9.8	
SW-040	< 0.009	U	75200		0.020		**5.05**		2.4	J	9.9	
SW-041	**1.5**		4900		0.28		**4.81**		**136**		**231**	
SW-042	0.075		7710		0.043		2.37		**21**		46.2	
SW-043	< 0.008	U	71700		< 0.008	U	2.28		4.2		0.7	J
SW-043	< 0.009	U	79300		< 0.009	U	**3.10**		13.0		0.6	J
SW-044	0.039		53100		< 0.008	U	**7.62**		5.7		6.2	
SW-045	**1.74**		1020		0.425		**3.01**		**133**		**251**	
SW-045	**1.77**		1000		0.421		**3.08**		**134**		**245**	
SW-046	< 0.008	U	29200		< 0.008	U	0.854		2.6	J	1.6	J
SW-047	< 0.008	U	38500		< 0.008	U	0.744		< 1.5	U	2.2	J
SW-048	< 0.008	U	71100		< 0.008	U	**3.87**		3.5	J	2.7	J
SW-048	< 0.009	U	85500		< 0.009	U	**3.60**		5.0		< 0.4	U
SW-049	< 0.002	U	16100		0.105		1.77		2.9	J	0.9	J
SW-049	< 0.002	U	16100		0.106		1.78		2.9	J	1.1	J
SW-049	< 0.009	U	15500		0.087		1.78		2.1	J	0.4	J

Notes:

335 Value is above the Ecological screening level

1. Ecological screening levels, minimum of sources presented in RA Approach (Appendix B to the RI Work Plan)
2. Selenium used from the EPA freshwater aquatic life criteria (2016) for lentic and lotic systems

< - Result is not detected above the method detection limit (MDL)

CAS - Chemical Abstracts Service

J - Result is estimated, J+ denotes estimated value biased high

mg/l - milligram per liter

N/A - No Screening level available

QC - Quality Control

U - Result is not detected above the MDL

µg/L - microgram per liter

*Water source is upgradient of mining, but the dikes or dams that hold back the water are of unknown composition

Table 3.1-2: Surface Water Sampling Results – Total Fraction

						Analyte	Hardness, Calcium Carbonate		Aluminum		Antimony		Arsenic	
						CAS #	HARDCA		7429-90-5		7440-36-0		7440-38-2	
						Analysis Method	SM2340B		SW6010C		SW6020		E1632A	
						Ecological Screening Level	N/A		87		6		N/A	
						Human Health Screening Level	N/A		5300000		5.6		0.018	
						Units	mg/l		µg/L		µg/L		µg/L	
Site	**Site Description**	**Sample Date**	**Sample QC**	**Position**	**Waterbody Type**	**Area**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
Blank	--	5/17/2018	Blank	--	--	--	0.067	J	< 3	U	< 0.020	U	0.005	J
Blank	--	5/22/2018	Blank	--	--	--	0.027	J	< 3	U	0.048	J	< 0.003	U
Blank	--	5/23/2018	Blank	--	--	--	0.034	J	< 3	U	0.046	J	< 0.003	U
Blank	--	9/13/2018	Blank	--	--	--	0.08	J	4	J	< 0.020	U	0.003	J
Blank	--	9/18/2018	Blank	--	--	--	0.066	J	< 4	U	< 0.020	U	0.010	J
SW-002	Lincoln Creek below North Limb	5/23/2018		Creek	Downgradient	Northwest of North Limb	394		**2460**		0.348		**1.71**	
SW-003	O, P Pit Lake	5/23/2018		Pit Lake	On disturbance	North Limb	662		13		0.557		**0.97**	
SW-003	O, P Pit Lake	9/20/2018		Pit Lake	On disturbance	North Limb	925		66		0.931		**2.85**	
SW-004A	Cattle Pond A above O, P Pit(near reclaimed area)	5/23/2018		Pond	On disturbance	North Limb	186		64		0.251		**0.521**	
SW-004A	Cattle Pond A above O, P Pit(near reclaimed area)	9/19/2018		Pond	On disturbance	North Limb	263		**431**		0.336		**1.15**	
SW-005	Lincoln Creek above North Limb	5/23/2018		Creek	Upgradient or Background	Northeast of North Limb	324		**124**		0.191		**0.314**	
SW-006	Covered Springs(on Lincoln Creek going to east)	5/22/2018		Spring	Upgradient or Background	Northeast of North Limb	245		74		0.079		**0.209**	
SW-006	Covered Springs(on Lincoln Creek going to east)	9/19/2018		Spring	Upgradient or Background	Northeast of North Limb	240		5	J	0.036	J	**0.197**	
SW-007	Bronco Springs (almost due east of K Pit)	5/22/2018		Spring	Upgradient or Background	East of North Limb	314		< 3	U	0.096		**0.191**	
SW-007	Bronco Springs (almost due east of K Pit)	9/19/2018		Spring	Upgradient or Background	East of North Limb	306		77	J	0.069		**0.260**	
SW-007	Bronco Springs (almost due east of K Pit)	9/19/2018	Duplicate	Spring	Upgradient or Background	East of North Limb	303		43	J	0.069		**0.248**	
SW-008	Cow Spring / Unnamed pond near cattle trough(above K Pit)	5/23/2018		Spring	On disturbance	North Limb	429		**147**		0.142		**0.282**	
SW-008	Cow Spring / Unnamed pond near cattle trough(above K Pit)	9/20/2018		Spring	On disturbance	North Limb	379		**413**		0.256		**1.26**	
SW-009	Source of Bunkhouse Spring	5/21/2018		Spring	Upgradient or Background	East of North Limb	527		< 3	U	0.151		**0.567**	
SW-010	Pond #3 / Main Holding Pond above A12 Pit	5/21/2018		Pond	Upgradient*	East of Southern Part of North Limb	483		22		0.306		**0.764**	
SW-010	Pond #3 / Main Holding Pond above A12 Pit	9/18/2018		Pond	Upgradient*	East of Southern Part of North Limb	392		**158**		0.410		**0.772**	
SW-011	Pond 1 above A12 Pit (East)	5/21/2018		Pond	On disturbance	Southern Part of North Limb	480		26		0.229		**0.896**	
SW-011	Pond 1 above A12 Pit (East)	9/18/2018		Pond	On disturbance	Southern Part of North Limb	397		28		0.230		**1.28**	
SW-012	Pond 2 above A12 Pit (West)	5/21/2018		Pond	On disturbance	Southern Part of North Limb	479		40		0.238		**0.835**	
SW-012	Pond 2 above A12 Pit (West)	9/18/2018		Pond	On disturbance	Southern Part of North Limb	589		**297**		0.924		**4.34**	
SW-013	A12 Lake in A12 Pit	5/21/2018		Pit Lake	On disturbance	Southern Part of North Limb	519		11		0.428		**1.01**	
SW-013	A12 Lake in A12 Pit	9/19/2018		Pit Lake	On disturbance	Southern Part of North Limb	472		30		0.513		**1.35**	
SW-014	Big Willow Springs	5/17/2018		Spring	On disturbance	Between South 40 and East Limb	461		46		0.155		**0.377**	
SW-014	Big Willow Springs	9/13/2018		Spring	On disturbance	Between South 40 and East Limb	446		6	J	0.136		**0.376**	
SW-015	Willow Creek (Upper Ross Fork Creek)	5/16/2018		Creek	Downgradient	South 40	520		**470**		0.152		**1.02**	
SW-015	Willow Creek (Upper Ross Fork Creek)	9/11/2018		Creek	Downgradient	South 40	566		**2120**	J	0.161		**1.35**	
SW-016	Lake in JD/JF Pit	5/16/2018		Pit Lake	On disturbance	South 40	501		42		0.218		**1.54**	
SW-016	Lake in JD/JF Pit	9/12/2018		Pit Lake	On disturbance	South 40	483		**115**		0.322		**4.26**	
SW-018	Ross Fork Creek (downstream of Danielson Creek)	5/15/2018		Creek	On disturbance	West of South 40	86.1		**1740**		0.035	J	**1.29**	
SW-018	Ross Fork Creek (downstream of Danielson Creek)	9/12/2018		Creek	On disturbance	West of South 40	152		**168**		< 0.05	U	**1.77**	
SW-018	Ross Fork Creek (downstream of Danielson Creek)	9/12/2018	Duplicate	Creek	On disturbance	West of South 40	154		**159**		< 0.05	U	**1.70**	
SW-019	Ross Fork above the Narrows	5/15/2018		Creek	On disturbance	West of South 40	73.3		**1240**		0.029	J	**0.846**	
SW-019	Ross Fork above the Narrows	9/12/2018		Creek	On disturbance	West of South 40	136		**104**		< 0.05	U	**0.998**	
SW-020	Big Springs (spring only)	5/16/2018		Spring	Upgradient	South of South 40	80.4		**232**		< 0.020	U	**0.393**	
SW-020	Big Springs (spring only)	9/12/2018		Spring	Upgradient	South of South 40	115		26		< 0.020	U	**0.712**	
SW-021	Jeff Cabin Creek(water source for Fa kner Ranch)	5/18/2018		Creek	Upgradient	South of East Limb & SE of South 40	150		**910**		0.111		**2.46**	
SW-021	Jeff Cabin Creek(water source for Fa kner Ranch)	9/18/2018		Creek	Upgradient	South of East Limb & SE of South 40	187		**162**		0.027	J	**2.55**	
SW-022	Lower Big Jimmy Creek Spring(area feeding into Portneuf River)	5/18/2018		Creek	Upgradient or Background	East of South 40	277		**180**		0.174		**4.26**	
SW-022	Lower Big Jimmy Creek Spring(area feeding into Portneuf River)	9/18/2018		Creek	Upgradient or Background	East of South 40	232		**87**		0.049	J	**1.01**	
SW-023	Portneuf River (downstream of Bakers Creek)	5/18/2018		River	Downgradient	East of East Limb	362		81		0.128		**1.46**	
SW-023	Portneuf River (downstream of Bakers Creek)	9/17/2018		River	Downgradient	East of East Limb	376		**181**		0.080		**1.93**	
SW-024A	Portneuf River (above Bakers Creek)	5/18/2018		River	Downgradient	East of East Limb	297		**89**		0.156		**1.15**	
SW-024A	Portneuf River (above Bakers Creek)	9/17/2018		River	Downgradient	East of East Limb	212		**246**		0.102		**1.93**	
SW-025	Z Pit Lake	5/17/2018		Pit Lake	On disturbance	East Limb	260		**109**		0.317		**0.573**	
SW-025	Z Pit Lake	9/14/2018		Pit Lake	On disturbance	East Limb	249		79		0.507		**1.83**	
SW-026	Queedup Springs(by Lone Pine Canyon Road)	5/17/2018		Spring	Downgradient	East of East Limb	604		< 3	U	< 0.020	U	**3.28**	
SW-026	Queedup Springs(by Lone Pine Canyon Road)	9/13/2018		Spring	Downgradient	East of East Limb	557		5	J	0.020	J	**3.21**	
SW-028	Lone Pine Spring(Y Spring South, along Lone Pine Road)	5/17/2018		Spring	Upgradient	East of East Limb	475		**440**		0.079		**0.148**	
SW-028	Lone Pine Spring(Y Spring South, along Lone Pine Road)	9/13/2018		Spring	Upgradient	East of East Limb	555		**1460**		0.105		**0.542**	

Table 3.1-2: Surface Water Sampling Results – Total Fraction

						Analyte	Hardness, Calcium Carbonate		Aluminum		Antimony		Arsenic	
						CAS #	HARDCA		7429-90-5		7440-36-0		7440-38-2	
						Analysis Method	SM2340B		SW6010C		SW6020		E1632A	
						Ecological Screening Level	N/A		87		6		N/A	
						Human Health Screening Level	N/A		5300000		5.6		0.018	
						Units	mg/l		µg/L		µg/L		µg/L	
Site	**Site Description**	**Sample Date**	**Sample QC**	**Position**	**Waterbody Type**	**Area**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
SW-029	W Pit Lake	5/20/2018		Pit Lake	Downgradient	East Limb	344		9	J	0.289		**23.4**	
SW-029	W Pit Lake	9/14/2018		Pit Lake	Downgradient	East Limb	329		17		0.395		**67.9**	
SW-030	East Limb North Pond / Holding pond below Y intersection(above HH Pit)	5/20/2018		Pond	Upgradient*	West of East Limb	344		**137**		0.198		**0.659**	
SW-030	East Limb North Pond / Holding pond below Y intersection(above HH Pit)	9/14/2018		Pond	Upgradient*	West of East Limb	292		**891**		0.230		**1.06**	
SW-031	Portneuf River (above U Creek)	5/22/2018		River	Upgradient or Background	East of North Limb & NE East Limb	270		**1360**		0.131		**0.822**	
SW-031	Portneuf River (above U Creek)	9/19/2018		River	Upgradient or Background	East of North Limb & NE East Limb	224		**561**		0.052		**0.608**	
SW-032	Red Rock Spring	5/22/2018		Spring	Upgradient or Background	East of North Limb	226		**100**		0.116		**0.429**	
SW-033	Mud Springs (north & east of mine, along road near Red Rock Spring)	5/22/2018		Spring	Upgradient or Background	East of North Limb	161		**1080**		0.122		**2.11**	
SW-033	Mud Springs (north & east of mine, along road near Red Rock Spring)	9/19/2018		Spring	Upgradient or Background	East of North Limb	193		**2880**		0.062		**2.32**	
SW-034	North Fork of Bakers Creek	5/18/2018		Creek	Downgradient	East of East Limb	521		12		0.142		**1.47**	
SW-034	North Fork of Bakers Creek	9/17/2018		Creek	Downgradient	East of East Limb	497		11		0.039	J	**1.47**	
SW-035	U Creek(above confluence with Portneuf River)	5/22/2018		Creek	Downgradient	East of North Limb	385		**209**		0.143		**0.708**	
SW-035	U Creek(above confluence with Portneuf River)	9/19/2018		Creek	Downgradient	East of North Limb	354		**209**		0.143		**0.632**	
SW-036	Seep and Pond below EE-2	5/17/2018		Spring	Downgradient	East Limb	386		56		0.119		**0.622**	
SW-036	Seep and Pond below EE-2	9/13/2018		Spring	Downgradient	East Limb	880		**2350**		0.648		**2.87**	
SW-037	Willow Creek (Downstream of South 40 Area, upstream of Ross Fork Creek)	5/16/2018		Creek	Downgradient	South 40	500		30		0.136		**0.900**	
SW-037	Willow Creek (Downstream of South 40 Area, upstream of Ross Fork Creek)	5/16/2018	Duplicate	Creek	Downgradient	South 40	501		30		0.132		**0.956**	
SW-037	Willow Creek (Downstream of South 40 Area, upstream of Ross Fork Creek)	9/11/2018		Creek	Downgradient	West of South 40	452		< 11	U	0.156		**0.926**	
SW-038	Lincoln Peak Spring(Above and east of the M Pit area)	5/23/2018		Spring	Upgradient	East of North Limb	477		**256**		0.119		**0.125**	
SW-038	Lincoln Peak Spring(Above and east of the M Pit area)	9/20/2018		Spring	Upgradient	East of North Limb	471		**560**		0.078		**0.229**	
SW-039	Y Spring(Between SW-014 and SW-015)	5/16/2018		Spring	Downgradient	South 40	565		84		0.400		**1.15**	
SW-039	Y Spring(Between SW-014 and SW-015)	9/12/2018		Spring	Downgradient	South 40	592		**1070**		0.382		**1.65**	
SW-040	Seep east of 11-2 Overburden Disposal Area (OBDA)	5/20/2018		Spring	On or near disturbance	East Limb	583		74		0.136		**0.745**	
SW-040	Seep east of 11-2 Overburden Disposal Area (OBDA)	8/27/2018		Spring	On or near disturbance	East Limb	557		24		0.058		**1.03**	
SW-040	Seep east of 11-2 Overburden Disposal Area (OBDA)	9/13/2018		Spring	On or near disturbance	East Limb	542		23		0.063		**0.860**	
SW-041	Catch Basin northeast of 11-2 OBDA	5/20/2018		Spring	On or near disturbance	East Limb	154		**1810**		2.96		**9.84**	
SW-042	Catch Basin northeast of AA-2 OBDA	5/20/2018		Spring	Downgradient	East Limb	130		**3710**		0.533		**2.32**	
SW-043	Spring east of AA-2 OBDA	5/20/2018		Spring	Downgradient	East Limb	541		76		0.107		**1.18**	
SW-043	Spring east of AA-2 OBDA	9/13/2018		Spring	Downgradient	East Limb	555		**16600**		0.151		**7.87**	
SW-044	Seep Area above and northeast of W Pit	5/20/2018		Spring	On disturbance	East Limb	146		51		0.356		**1.52**	
SW-045	BB-2 North Spring and Pond	5/20/2018		Spring	On disturbance	East Limb	129		**2630**		1.17		**8.8**	
SW-045	BB-2 North Spring and Pond	5/20/2018	Duplicate	Spring	On disturbance	East Limb	125		**2550**		1.13		**8.17**	
SW-046	Pond on Lone Pine Road	5/20/2018		Spring	Downgradient	East Limb	437		22		0.143		**0.26**	
SW-047	Seep and Pond below FF-2	5/17/2018		Spring	Downgradient	East Limb	556		**100**		0.054		**0.190**	
SW-048	Spring box below OBDA 11, downstream of SW-040	5/20/2018		Spring	Downgradient	East Limb	530		**455**		0.145		**0.421**	
SW-048	Spring box below OBDA 11, downstream of SW-040	9/13/2018		Spring	Downgradient	East Limb	557		**4980**		0.140		**2.49**	
SW-049	Lincoln Creek(downstream of Yandell and Warm Springs)	5/23/2018		Creek	Downgradient	Northwest of North Limb	366		**262**		0.09		**2.19**	
SW-049	Lincoln Creek(downstream of Yandell and Warm Springs)	5/23/2018	Duplicate	Creek	Downgradient	Northwest of North Limb	368		**280**		0.099		**2.25**	
SW-049	Lincoln Creek(downstream of Yandell and Warm Springs)	9/20/2018		Creek	Downgradient	Northwest of North Limb	358		**205**		0.051		**2.44**	

Table 3.1-2: Surface Water Sampling Results – Total Fraction

	Barium		Beryllium		Boron		Cadmium		Calcium		Chromium		Chromium (III)		Hexavalent Chromium		Cobalt		Copper	
	7440-39-3		7440-41-7		7440-42-8		7440-43-9		7440-70-2		7440-47-3		16065-83-1		18540-29-9		7440-48-4		7440-50-8	
	SW6010C		SW6010C		SW6020		SW6020		SW6010C		SW6010C		DIFFERENCE CALC		E218.6		SW6010C/SW6020		SW6010C	
	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A	
	1000		2.7		1.6		0.25		N/A		180		180		0.523		3		9	
	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Site	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
Blank	< 0.3	U	< 0.5	U	0.9	J	< 0.006	U	19	J	< 0.9	U	< 0.9	U	< 0.010	U	< 0.5	U	< 2.1	U
Blank	< 0.3	U	< 0.5	U	< 0.5	U	< 0.006	U	9	J	< 0.9	U	< 0.9	U	< 0.01	U	< 0.008	U	< 2.1	U
Blank	< 0.3	U	< 0.5	U	1	J	< 0.006	U	10	J	< 0.9	U	< 0.9	U	< 0.01	U	< 0.008	U	< 2.1	U
Blank	< 0.6	U	< 0.2	U	**2.0**		< 0.008	U	23		< 0.6	U	< 0.6	U	< 0.010	U	< 0.009	U	< 0.9	U
Blank	< 0.6	U	< 0.2	U	1.3	J	< 0.008	U	18	J	< 0.6	U	< 0.6	U	< 0.010	U	< 0.009	U	< 0.9	U
SW-002	106		< 0.5	U	**75**		**0.409**	J	80500		6.6		6.4	J	0.211	J+	0.866		6.3	
SW-003	55.4		< 0.5	U	**93.5**		**1.37**	J	167000		1.7	J	1.6	J	0.077	J+	0.668		2.2	J
SW-003	66.3		< 0.2	U	**107**		**0.761**	J	179000		4.0	J	3.9	J	0.066	J	0.619		< 0.9	U
SW-004A	96		< 0.5	U	**37.7**		0.093		52200		1.6	J	1.5	J	0.072	J+	0.106		< 2.1	U
SW-004A	101		< 0.2	U	**20.7**		**0.598**	J	74400		4.7		4.7	J	0.050	J	0.246		< 0.9	U
SW-005	163		< 0.5	U	**30.9**		< 0.006	U	102000		< 0.9	U	< 0.9	UJ	0.128	J+	0.092		< 2.1	U
SW-006	138		< 0.5	U	**16.9**		< 0.006	U	82000		< 0.9	U	< 0.9	UJ	0.1	J	0.053		< 2.1	U
SW-006	134		< 0.2	U	**18.2**		< 0.008	J	81200		< 0.6	U	< 0.6	UJ	0.134	J	0.022		< 0.9	U
SW-007	33.6		< 0.5	U	**33.4**		< 0.006	U	87300		< 0.9	U	< 0.9	UJ	0.494	J	0.01	J	6.8	
SW-007	33.2		< 0.2	U	**33.6**		< 0.008	J	85600		< 0.6	U	< 0.6	UJ	**0.524**	J	0.062		< 0.9	U
SW-007	32.8		< 0.2	U	**33.8**		< 0.008	U	84800		< 0.6	U	< 0.6	UJ	**0.534**	J	0.060		< 0.9	U
SW-008	55.1		< 0.5	U	**51.2**		0.06		125000		1.2	J	1.1	J	0.106	J	0.166		< 2.1	U
SW-008	106		< 0.2	U	**94**		0.189		92500		1.2	J	1.2	J	0.026	J	0.483		< 0.9	U
SW-009	81.3		< 0.5	U	**106**		0.017		143000		< 0.9	U	< 0.9	U	0.104	J	0.053		< 2.1	U
SW-010	63.1		< 0.5	U	**74.6**		0.021		127000		< 0.9	U	< 0.9	U	0.036	J	0.183		< 2.1	U
SW-010	75.8		< 0.2	U	**115**		0.025		76000		< 0.6	U	< 0.6	U	< 0.010	U	0.267		< 0.9	U
SW-011	54.3		< 0.5	U	**76.8**		0.029		121000		< 0.9	U	< 0.9	U	0.041	J	0.161		< 2.1	U
SW-011	58.6		< 0.2	U	**109**		0.027		66200		< 0.6	U	< 0.6	U	< 0.010	U	0.147		< 0.9	U
SW-012	49.9		< 0.5	U	**77.1**		0.107		121000		< 0.9	U	< 0.9	U	0.04	J	0.177		< 2.1	U
SW-012	207		< 0.2	U	**186**		**0.698**		107000		3.7	J	3.7	J	0.036	J	0.483		< 0.9	U
SW-013	65.4		< 0.5	U	**73.8**		**1.75**		129000		< 0.9	U	< 0.9	U	**0.909**	J	0.093		< 2.1	U
SW-013	61.4		< 0.2	U	**90**		0.064		104000		< 0.6	U	< 0.6	UJ	**0.754**	J	0.082		< 0.9	U
SW-014	152		< 0.5	U	**48.8**		0.134		140000		< 0.9	U	< 0.9	UJ	0.132	J	0.7	J	< 2.1	U
SW-014	146		< 0.2	U	**53.5**		0.097		131000		< 0.6	U	< 0.6	UJ	0.187	J	0.029	J	< 0.9	U
SW-015	136		< 0.5	U	**46.9**	J	0.031		150000		< 0.9	U	< 0.9	UJ	0.040	J	0.267		< 2.1	U
SW-015	170		< 0.2	U	**70.7**	J	0.129		157000		2.6	J	2.6	J	0.045	J	0.841		< 4.2	U
SW-016	108		< 0.5	U	**58.2**	J	**1.59**		128000		1.3	J	< 0.9	UJ	**0.987**	J	0.075		< 2.1	U
SW-016	105		< 0.2	U	**65.8**		**1.23**		110000		3.5	J	3.3	J	0.212	J	0.100		< 4.2	U
SW-018	61.8		< 0.5	U	**10.3**	J	0.058		23300		1.8	J	1.8	J	0.062		0.659		2.4	J
SW-018	63.6		< 0.2	U	**15.2**		0.012		38500		< 0.6	U	< 0.6	UJ	0.101	J	0.114		< 0.9	U
SW-018	65.4		< 0.2	U	**12.8**		0.011		39100		< 0.6	U	< 0.6	UJ	0.107	J	0.109		< 0.9	U
SW-019	47.7		< 0.5	U	**8.7**	J	0.035		19800		< 0.9	U	< 0.9	U	0.074		0.463		2.2	J
SW-019	51.5		< 0.2	U	**9.4**		0.008		34300		< 0.6	U	< 0.6	UJ	0.137	J	0.074		< 0.9	U
SW-020	33.5		< 0.5	U	**8.1**	J	< 0.006	U	21500		< 0.9	U	< 0.9	U	0.131		0.070		< 2.1	U
SW-020	41.5		< 0.2	U	**8.6**		< 0.008	U	27800		< 0.6	U	< 0.6	UJ	0.212	J	0.019	J	< 0.9	U
SW-021	52.5		< 0.5	U	**14.8**		0.019		37400		< 0.9	U	1.1	J	0.178		0.174		< 2.1	U
SW-021	54.2		< 0.2	U	**13.1**		< 0.008	U	44700		< 0.6	U	< 0.6	UJ	0.295	J	0.087		< 0.9	U
SW-022	183		< 0.5	U	**31.8**		0.021		84500		< 0.9	U	< 0.9	UJ	< 0.01	UJ	0.48		< 2.1	U
SW-022	123		< 0.2	U	**22.8**		< 0.008	U	65200		< 0.6	U	< 0.6	UJ	0.042	J	0.084		< 0.9	U
SW-023	95.1		< 0.5	U	**42.5**		0.013		91700		< 0.9	U	< 0.9	UJ	0.05	J	0.097		< 2.1	U
SW-023	66.9		< 0.2	U	**69.5**		0.013	J	76500		< 0.6	U	< 0.6	UJ	0.056	J	0.079		< 0.9	U
SW-024A	117		< 0.5	U	**33.4**		0.01	J	86300		< 0.9	U	1.2	J	0.043	J	0.102		< 2.1	U
SW-024A	121		< 0.2	U	**40.0**		0.012		58400		< 0.6	U	< 0.6	UJ	0.134	J	0.087		< 0.9	U
SW-025	39.4		< 0.5	U	**58.7**		**0.293**		44100		< 0.9	U	< 0.9	U	0.298	J	< 0.5	U	< 2.1	U
SW-025	34.0		< 0.2	U	**76.0**		**0.289**		27100		1.5	J	1.2	J	0.343	J	0.139		< 0.9	U
SW-026	29.2		< 0.5	U	**63.1**		0.179	J	157000		< 0.9	U	< 0.9	UJ	0.450	J	< 0.5	U	< 2.1	U
SW-026	28.7		< 0.2	U	**62.5**		0.179		140000		< 0.6	U	< 0.6	UJ	**1.67**	J	0.022	J	< 0.9	U
SW-028	122		< 0.5	U	**30.3**		0.018		148000		< 0.9	U	< 0.9	UJ	0.121	J	< 0.5	U	< 2.1	U
SW-028	169		< 0.2	U	**41.3**		0.063		167000		1.1	J	1.0	J	0.054	J	0.761		< 0.9	U

Table 3.1-2: Surface Water Sampling Results – Total Fraction

	Barium 7440-39-3 SW6010C N/A 1000 µg/L		Beryllium 7440-41-7 SW6010C N/A 2.7 µg/L		Boron 7440-42-8 SW6020 N/A 1.6 µg/L		Cadmium 7440-43-9 SW6020 N/A 0.25 µg/L		Calcium 7440-70-2 SW6010C N/A N/A µg/L		Chromium 7440-47-3 SW6010C N/A 180 µg/L		Chromium (III) 16065-83-1 DIFFERENCE CALC N/A 180 µg/L		Hexavalent Chromium 18540-29-9 E218.6 N/A 0.523 µg/L		Cobalt 7440-48-4 SW6010C/SW6020 N/A 3 µg/L		Copper 7440-50-8 SW6010C N/A 9 µg/L	
Site	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
SW-029	22.9		< 0.5	U	**72.6**		0.051		61400		< 0.9	U	< 0.9	U	0.069		0.166		< 2.1	U
SW-029	48.9		< 0.2	U	**70.5**		0.037		24900		< 0.6	U	< 0.6	U	0.065	J+	0.173		< 0.9	U
SW-030	51.9		< 0.5	U	**70.4**		0.022		88500		< 0.9	U	< 0.9	UJ	< 0.01	UJ	0.264		< 2.1	U
SW-030	95.1		< 0.2	U	**105**		0.059		51400		0.9	J	0.9	J	0.028	J	0.472		< 0.9	U
SW-031	123		< 0.5	U	**28.6**		0.079		79800		2.2	J	2.1	J	0.085	J	0.651		2.5	J
SW-031	77.9		< 0.2	U	**23.0**		0.016		65700		< 0.6	U	< 0.6	UJ	0.187	J	0.198		< 0.9	U
SW-032	66.7		< 0.5	U	**29.4**		< 0.006	U	59500		0.9	J	< 0.9	UJ	0.033	J	0.106		< 2.1	U
SW-033	67.6		< 0.5	U	**35.3**		0.028		45100		1.6	J	1.6	J	< 0.01	UJ	1.09		< 2.1	U
SW-033	85.4		< 0.2	U	**41.2**		0.021		53400		3.3	J	3.3	J	0.030	J	0.800		< 0.9	U
SW-034	44.1		< 0.2	U	**74.4**		0.009		109000		0.6	J	< 0.6	UJ	0.042	J	0.08		< 0.9	U
SW-034	27.6		< 0.2	U	**88.9**		< 0.008	U	91900		< 0.6	U	< 0.6	UJ	0.070	J	0.047		< 0.9	U
SW-035	106		< 0.5	U	**36.1**		< 0.006	U	110000		< 0.9	U	< 0.9	UJ	0.047	J	0.179		< 2.1	U
SW-035	119		< 0.2	U	**33.2**		0.018		102000		< 0.6	U	< 0.6	UJ	0.033	J	0.167		< 0.9	U
SW-036	72.5		< 0.5	U	**69.9**		0.014		97200		< 0.9	U	< 0.9	U	0.035	J	< 0.5	U	< 2.1	U
SW-036	591		0.2	J	**229**		0.127		181000		2.0	J	2.0	J	< 0.02	UJ	**3.01**		1.4	J
SW-037	121		< 0.5	U	**43.9**	J	0.009	J	141000		< 0.9	U	< 0.9	UJ	0.040	J	0.061		< 2.1	U
SW-037	118		< 0.5	U	**44.4**	J	0.007	J	142000		< 0.9	U	< 0.9	UJ	0.042	J	0.056		< 2.1	U
SW-037	123		< 0.2	U	**70.4**		0.010	J	109000		< 0.6	U	< 0.6	UJ	0.062	J	0.055		< 0.9	U
SW-038	98.5		< 0.5	U	**40.7**		< 0.006	U	143000		0.9	J	< 0.9	UJ	0.144	J+	0.129		< 2.1	U
SW-038	97.9		< 0.2	U	**40.3**		< 0.008	U	143000		< 0.6	U	< 0.6	UJ	0.121	J	0.221		< 0.9	U
SW-039	172		< 0.5	U	**63.3**	J	0.055		169000		< 0.9	U	< 0.9	UJ	0.100	J	0.128		< 2.1	U
SW-039	158		< 0.2	U	**73.9**		0.109		171000		1.3	J	1.2	J	0.060	J	0.556		< 0.9	U
SW-040	85.4		< 0.5	U	**113**		**1.41**		144000		5.3		3.1	J	**2.18**	J	0.115		< 2.1	U
SW-040	87.7		< 0.2	U	**114**		**1.06**		135000		2.0	J	1.0	J	**0.983**		0.050		< 0.9	U
SW-040	82.5		< 0.2	U	**121**		**1.06**		128000		0.7	J	< 0.6	UJ	**2.71**	J	0.055		< 0.9	U
SW-041	83.8		< 0.5	U	**52.6**		**5.72**		47200		81.6		81.5		0.124	J	1.79		**40.4**	
SW-042	96.5		< 0.5	U	**51.1**		**0.928**		33200		12.5		12.5		0.019	J	2.58		6.7	
SW-043	82.3		< 0.5	U	**65.3**		0.035		146000		< 0.9	U	1.2	J	0.183	J	0.452		< 2.1	U
SW-043	340		0.8	J	**82.9**		**1.30**		138000		29.0		29	J	0.022	J	**8.23**		**19.1**	
SW-044	13.3		< 0.5	U	**102**		**0.357**		36100		< 0.9	U	2.5	J	0.13		0.355		2.9	J
SW-045	46.9		< 0.5	U	**42.9**		**6.56**		39000		93.8		83.5		0.282	J	1.89		**40.5**	
SW-045	45		< 0.5	U	**42.8**		**6.21**		38000		89.4		89.1		0.288	J	1.84		**39.4**	
SW-046	102		< 0.5	U	**30.9**		0.083		130000		< 0.9	U	< 0.9	UJ	0.148	J	0.068		< 2.1	U
SW-047	73.9		< 0.5	U	**43.8**		0.012	J	161000		1.2	J	1.0	J	0.178	J	< 0.5	U	< 2.1	U
SW-048	80.3		< 0.5	U	**128**		0.061		132000		< 0.9	U	1	J	**0.629**	J	0.296		< 2.1	U
SW-048	153		< 0.2	U	**157**		**0.397**		123000		7.0		7	J	0.033	J	2.49		3.2	J
SW-049	41.9		< 0.5	U	**35.8**		0.016	J	94300		1.4	J	< 0.9	UJ	**0.614**	J+	0.137		< 2.1	U
SW-049	42.2		< 0.5	U	**37.5**		0.014	J	96900		< 0.9	U	< 0.9	UJ	**0.613**	J+	0.14		< 2.1	U
SW-049	40.8		< 0.2	U	**35.7**		0.010	J	95500		0.6	J	< 0.6	UJ	**0.645**	J	0.103		< 0.9	U

Table 3.1-2: Surface Water Sampling Results – Total Fraction

	Iron		Lead		Magnesium		Manganese		Mercury		Molybdenum		Nickel		Phosphorus		Potassium	
	7439-89-6		7439-92-1		7439-95-4		7439-96-5		7439-97-6		7439-98-7		7440-02-0		7723-14-0		7440-09-7	
	SW6010C		SW6020		SW6010C		SW6010C		SW7470		SW6010C		SW6010C		SW6010C		SW6010C	
	1000		N/A		N/A		N/A		0.025		35		N/A		N/A		N/A	
	300		2.5		N/A		50		0.025		35		52		N/A		N/A	
	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Site	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
Blank	< 3	U	0.007	J	4.7	J	< 0.3	U	< 0.02	U	< 0.9	U	< 0.9	U	13	J	< 50	U
Blank	< 3	U	0.014	J	1.2	J	< 0.3	U	< 0.02	U	< 0.9	U	< 0.9	U	12	J	< 50	U
Blank	< 3	U	0.004	J	2.3	J	< 0.3	U	< 0.02	U	< 0.9	U	< 0.9	U	10	J	60	J
Blank	< 3	U	< 0.006	U	5	J	0.1	J	< 0.02	U	< 0.5	U	< 0.4	U	21	J	< 60	U
Blank	< 3	U	< 0.006	U	5.0	J	0.09	J	< 0.02	U	0.6	J	< 0.4	U	12	J	< 60	U
SW-002	**2360**		1.73		46900		**86.5**		< 0.02	U	1.8	J	5.1		377		3480	
SW-003	**371**		0.097		59400		**231**		< 0.02	U	**108**		46.6		233		4800	
SW-003	**481**		0.145		116000		**463**		< 0.02	U	**111**		36.0		241		9210	
SW-004A	91		0.077		13600		35.9		< 0.02	U	1.4	J	1.9	J	66		990	
SW-004A	**625**		0.287		18700		**212**		< 0.02	U	< 4.2	U	5.4		352		8720	
SW-005	129		0.093		16900		18.9		< 0.02	U	< 0.9	U	< 0.9	U	43		1110	
SW-006	67		0.067		9700		3.7		< 0.02	U	< 0.9	U	< 0.9	U	47		960	
SW-006	16	J	< 0.04	U	9090		< 1.1	U	< 0.02	U	< 0.5	U	< 0.4	U	< 42	U	850	
SW-007	4	J	0.342		23200		1.9		< 0.02	U	< 0.9	U	< 0.9	U	< 6	U	880	
SW-007	79	J	0.055		22300		37.9		< 0.02	U	< 0.5	U	< 0.4	U	51		920	
SW-007	52	J	0.055		22200		39.1		< 0.02	U	< 0.5	U	< 0.4	U	48		890	
SW-008	177		0.128		28400		**81.1**		< 0.02	U	1.1	J	1.6	J	51		1460	
SW-008	**892**		0.430		36000		**291**		< 0.02	U	5.0		7.0		318		13700	
SW-009	< 3	U	< 0.004	U	41200		< 0.3	U	< 0.02	U	2.8	J	< 0.9	U	51		1750	
SW-010	48		0.04		40200		**228**		< 0.02	U	8.4		< 0.9	U	63		2220	
SW-010	186		0.189		49000		**94.3**		< 0.02	U	6.0		0.8	J	57		2650	
SW-011	70		0.04		43100		**277**		< 0.02	U	5.6		< 0.9	U	68		2310	
SW-011	57		0.055		56300		26.6		< 0.02	U	4.8		0.7	J	48		1660	
SW-012	100		0.055		43000		**144**		< 0.02	U	5.9		1.8	J	86		2230	
SW-012	**845**		0.412		78200		**1080**		< 0.02	U	20.8		13.7		751		17100	
SW-013	21		< 0.004	U	47800		12.6		< 0.02	U	23		15.8		< 6	U	2750	
SW-013	33		< 0.04	U	51600		18.3		< 0.02	U	24.9		8.8		< 42	U	2710	
SW-014	165		0.050		27000		< 0.3	U	< 0.02	U	2.2	J	< 0.9	U	69		1290	
SW-014	30		< 0.006	U	28900		0.2	J	< 0.02	U	< 4.2	U	< 0.4	U	64		1250	
SW-015	**455**		0.327		35300		44.9		< 0.02	U	1.9	J	< 0.9	U	76		1890	
SW-015	**2050**		1.41		42300		**122**		< 0.02	U	< 4.2	U	< 0.4	U	222		3140	
SW-016	64		0.059		44100		12.6		< 0.02	U	3.7	J	5.3		109		2030	
SW-016	151		0.125		50600		11.4		< 0.02	U	7.0		4.8		262		2570	
SW-018	**1690**		1.57		6790		**50.4**		< 0.02	U	< 0.9	U	1.9	J	108		1080	
SW-018	192		0.144		13500		21.0		< 0.02	U	< 0.5	U	< 0.4	U	43		850	
SW-018	187		0.162		13600		20.9		< 0.02	U	< 0.5	U	< 0.4	U	44		810	
SW-019	**1200**		1.14		5800		32.4		< 0.02	U	2.9	J	1.7	J	73		800	
SW-019	102		0.136		12300		3.8		< 0.02	U	< 0.5	U	< 0.4	U	< 42	U	650	
SW-020	239		0.200		6480		3.7		< 0.02	U	< 0.9	U	< 0.9	U	< 18	U	390	
SW-020	18	J	0.028		11000		< 1.1	U	< 0.02	U	< 0.5	U	< 0.4	U	< 42	U	420	
SW-021	**621**		0.381		13800		9.9		< 0.02	U	< 0.9	U	< 0.9	U	65		920	
SW-021	152		0.154		18300		6.4		< 0.02	U	< 0.5	U	< 0.4	U	48		770	
SW-022	**591**		0.198		16100		13.2		< 0.02	U	< 0.9	U	1.3	J	121		1900	
SW-022	83		0.071		16800		7.1		< 0.02	U	< 0.5	U	< 0.4	U	< 42	U	2470	
SW-023	87		0.066		32200		48		< 0.02	U	< 0.9	U	< 0.9	U	87		8470	
SW-023	155		0.088		45000		15.4		< 0.02	U	< 4.2	U	< 0.4	U	< 42	U	16900	
SW-024A	112		0.081		19800		46.3		< 0.02	U	4.5		< 0.9	U	104		2430	
SW-024A	212		0.132		16000		17.0		< 0.02	U	< 4.2	U	< 0.4	U	42		4690	
SW-025	227		0.107		36400		38.8		< 0.02	U	24.7		8.4		56		6330	
SW-025	140		0.080		44000		16.0		< 0.02	U	34.4		6.0		101		7830	
SW-026	< 10	U	< 0.010	U	51500		< 0.3	U	< 0.02	U	1.8	J	1.9	J	< 30	U	19200	
SW-026	27		0.006	J	50300		< 0.07	U	< 0.02	U	< 4.2	U	2.1	J	42		17100	
SW-028	**430**		0.303		25600		25.5		< 0.02	U	1.8	J	< 0.9	U	57		1250	
SW-028	**1640**		0.980		33600		**396**		0.02	J	< 4.2	U	0.8	J	182		1820	

Table 3.1-2: Surface Water Sampling Results – Total Fraction

	Iron		Lead		Magnesium		Manganese		Mercury		Molybdenum		Nickel		Phosphorus		Potassium	
	7439-89-6		7439-92-1		7439-95-4		7439-96-5		7439-97-6		7439-98-7		7440-02-0		7723-14-0		7440-09-7	
	SW6010C		SW6020		SW6010C		SW6010C		SW7470		SW6010C		SW6010C		SW6010C		SW6010C	
	1000		N/A		N/A		N/A		0.025		35		N/A		N/A		N/A	
	300		2.5		N/A		50		0.025		35		52		N/A		N/A	
	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Site	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
SW-029	95		0.027		46300		**212**		< 0.02	U	5.7		4.2		83		20300	
SW-029	49		0.024		64800		**119**		< 0.02	U	10.7		3.7	J	68		26800	
SW-030	136		0.137		29800		**97.4**		< 0.02	U	< 0.9	U	< 0.9	U	256		6510	
SW-030	**703**		0.597		39700		**141**		< 0.02	U	< 4.2	U	1.2	J	290		7910	
SW-031	**1590**		1.04		17100		**60.5**		< 0.02	U	< 0.9	U	1.3	J	229		1860	
SW-031	**535**		0.272		14500		19.6		< 0.02	U	< 0.5	U	< 0.4	U	95		1350	
SW-032	77		0.055		18800		2		< 0.02	U	0.9	J	1.3	J	56		390	
SW-033	**1200**		0.68		11800		**171**		< 0.02	U	1.2	J	2.2	J	110		640	
SW-033	**2550**		1.83		14500		17.6		< 0.02	U	< 0.5	U	0.5	J	115		1060	
SW-034	< 3	U	0.022		60400		15.5		< 0.02	U	< 0.5	U	< 0.4	U	56		21500	
SW-034	10	J	0.025		65000		< 0.07	U	< 0.02	U	6.8	J	< 0.4	U	< 42	U	24500	
SW-035	226		0.149		26900		**57.4**		< 0.02	U	2.9	J	< 0.9	U	77		1340	
SW-035	229		0.125		24100		**74.8**		< 0.02	U	< 4.2	U	< 0.4	U	70		1680	
SW-036	84		0.089		34800		**198**		< 0.02	U	3.0	J	2.0	J	80		7640	
SW-036	**5330**		1.36		104000		**14200**		< 0.02	U	10.0		13.9		901		32600	
SW-037	27		0.037		35900		0.3	J	< 0.02	U	2.7	J	< 0.9	U	< 22	U	1650	
SW-037	36		0.039		35600		0.4	J	< 0.02	U	2.2	J	< 0.9	U	< 23	U	1680	
SW-037	8	J	0.027		43600		< 0.07	U	< 0.02	U	< 4.2	U	< 0.4	U	< 42	U	2650	
SW-038	235		0.225		29200		15.6		< 0.02	U	1.6	J	< 0.9	U	< 6	U	1370	
SW-038	**496**		0.269		27600		**116**		< 0.02	U	< 4.2	U	< 0.4	U	62		1380	
SW-039	86		0.069		34800		41.3		< 0.02	U	5.5		< 0.9	U	167		3290	
SW-039	**1010**		0.710		40100		**152**		< 0.02	U	4.9		< 0.4	U	181		3660	
SW-040	192		0.111		54200		3.4		< 0.02	U	< 0.9	U	4.5		402		3080	
SW-040	33	J	0.025		53400		< 0.07	U	< 0.02	U	< 4.2	U	2.1	J	19		2990	
SW-040	56		0.023		54100		1.8		< 0.02	U	< 4.2	U	2.1	J	91		3010	
SW-041	**3120**		2.24		8720		**683**		**0.14**	J	**46.3**		**76**		2560		20300	
SW-042	**3790**		1.95		11400		**1870**		< 0.02	U	15.2		17.7		735		12800	
SW-043	107		0.072		42800		**300**		< 0.02	U	< 0.9	U	< 0.9	U	250		3460	
SW-043	**19700**		**9.32**		51200		**4190**		**0.03**	J	< 4.2	U	25.0		1700		7170	
SW-044	246		0.08		13600		29.6		< 0.02	U	13.7		9.8		247		350	
SW-045	**4500**		2.1		7580		**145**		**0.18**	J	23		**73.6**		3370		17500	
SW-045	**4220**		2.04		7430		**138**		**0.17**	J	23.1		**72.2**		3110		17300	
SW-046	33		0.027		27400		13.2		< 0.02	U	< 0.9	U	< 0.9	U	< 6	U	1230	
SW-047	96		0.081		37300		42.2		< 0.02	U	3.3	J	< 0.9	U	50		1340	
SW-048	**448**		0.29		48600		**58**		< 0.02	U	< 0.9	U	1.3	J	95		840	
SW-048	**5450**		**3.06**		60600		**800**		0.02	J	< 4.2	U	6.3		582		5000	
SW-049	255		0.244		31600		14.8		< 0.02	U	1.4	J	1.2	J	42		5350	
SW-049	284		0.247		30700		13.5		< 0.02	U	1.6	J	0.9	J	45		5220	
SW-049	187		0.173		29000		8.9		< 0.02	U	< 4.2	U	< 0.4	U	< 42	U	4620	

Table 3.1-2: Surface Water Sampling Results – Total Fraction

	Selenium		Silver		Sodium		Thallium		Uranium		Vanadium		Zinc	
	7782-49-2		7440-22-4		7440-23-5		7440-28-0		7440-61-1		7440-62-2		7440-66-6	
	SW6020		SW6020		SW6010C		SW6020		SW6020		SW6010C		SW6010C	
	N/A		N/A		N/A		0.8		N/A		N/A		N/A	
	5		0.34		N/A		0.24		15900		8.1		120	
	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Site	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
Blank	< 0.2	U	< 0.008	U	40	J	< 0.008	U	< 0.006	U	< 1.1	U	< 0.6	U
Blank	< 0.2	U	< 0.008	U	< 20	U	< 0.008	U	< 0.006	U	< 1.1	U	< 0.6	U
Blank	< 0.2	U	< 0.008	U	< 20	U	< 0.008	U	< 0.006	U	< 1.1	U	< 0.6	U
Blank	< 0.2	U	< 0.009	U	30	J	< 0.009	U	< 0.008	U	< 0.5	U	< 0.4	U
Blank	< 0.2	U	< 0.009	U	30	J	< 0.009	U	< 0.008	U	< 0.5	U	< 0.4	U
SW-002	2.6		0.057		46500		0.047		2.22		**17.9**		23.3	
SW-003	**48.5**		0.04		56000		0.085		23.1		**13.1**		44.9	
SW-003	**18.9**		0.051		144000		0.037		8.79		**27.6**		20.6	
SW-004A	4.4		0.013	J	15000		< 0.008	U	0.853		4	J	1.8	J
SW-004A	3.7		0.069		20500		0.014	J	0.603		7.5		12.1	
SW-005	1		< 0.008	U	20000		< 0.008	U	1.02		2	J	1.2	J
SW-006	0.4	J	< 0.008	U	9910		< 0.008	U	0.682		1.3	J	0.8	J
SW-006	0.4	J	< 0.009	U	9190		< 0.009	U	0.613		1.1	J	0.5	J
SW-007	0.6	J	< 0.008	U	21600		< 0.008	U	0.633		< 1.1	U	4.7	
SW-007	0.6	J	< 0.009	U	20400		< 0.009	U	0.604		0.9	J	0.6	J
SW-007	0.6	J	< 0.009	U	20300		< 0.009	U	0.630		1.1	J	0.4	J
SW-008	2		< 0.008	U	36500		< 0.008	U	1.82		1.9	J	2.1	J
SW-008	0.9	J	< 0.02	U	48800		< 0.009	U	0.828		5.3		6.9	
SW-009	3		< 0.008	U	89200		0.015	J	5.63		< 1.1	U	1.2	J
SW-010	3.2		< 0.008	U	67100		< 0.008	U	4.26		< 1.1	U	1.6	J
SW-010	0.7	J	< 0.009	U	84900		< 0.009	U	2.42		4.0	J	< 4.2	U
SW-011	2.5		< 0.008	U	68600		0.01	J	3.96		< 1.1	U	1.3	J
SW-011	0.6	J	< 0.02	U	84700		< 0.02	U	1.29		1.6	J	3.4	J
SW-012	2.7		0.013	J	68100		< 0.008	U	3.84		< 1.1	U	2.5	J
SW-012	2.9		0.073		127000		0.015	J	7.67		**17.1**		15.9	
SW-013	**86.8**		0.009	J	66100		0.088		7.17		**31.6**		32.9	
SW-013	**82.6**		< 0.009	U	70300		0.060		7.56		**27.3**		< 4.2	U
SW-014	2.7		< 0.008	U	46300		0.029		1.76		< 1.1	U	17.2	
SW-014	2.5		< 0.009	U	53200		< 0.02	U	1.78		0.6	J	2.6	J
SW-015	2.8		< 0.008	U	35700		< 0.008	U	2.03		2.7	J	2.7	J
SW-015	1.1		< 0.02	U	42300		0.028		1.68		6.4		10.7	
SW-016	**71.5**		0.082		41800		0.137		9.58		**19.2**		6.7	
SW-016	**24.3**		0.148		49300		0.147		8.68		**20.7**		7.1	
SW-018	< 0.2	U	0.010	J	5470		0.026		0.328		3.6	J	7.2	
SW-018	< 0.2	U	< 0.009	U	9990		< 0.02	U	0.540		0.8	J	0.6	J
SW-018	< 0.2	U	< 0.009	U	10100		< 0.02	U	0.520		0.5	J	0.7	J
SW-019	< 0.2	U	< 0.008	U	3630		0.018	J	0.198		2.0	J	4.8	
SW-019	< 0.2	U	< 0.009	U	6450		< 0.009	U	0.335		< 0.5	U	0.4	J
SW-020	< 0.2	U	< 0.008	U	2660		< 0.008	U	0.134		< 1.1	U	1.1	J
SW-020	< 0.2	U	< 0.009	U	4060		< 0.009	U	0.305		< 0.5	U	0.5	J
SW-021	< 0.2	U	< 0.008	U	6570		0.084		0.398		2.3	J	2.7	J
SW-021	< 0.2	U	< 0.009	U	7480		0.047		0.487		1.5	J	< 4.2	U
SW-022	0.4	J	< 0.008	U	17300		< 0.008	U	0.445		2.2	J	2	J
SW-022	< 0.2	U	< 0.009	U	14200		< 0.009	U	1.03		2.9	J	< 4.2	U
SW-023	0.4	J	< 0.008	U	25000		< 0.008	U	1.09		2.8	J	0.6	J
SW-023	0.8	J	< 0.009	U	28500		< 0.009	U	1.28		2.3	J	1.2	J
SW-024A	0.3	J	< 0.008	U	20200		< 0.008	U	0.953		2.7	J	1.1	J
SW-024A	0.3	J	< 0.009	U	19100		0.034		1.49		3.9	J	1.1	J
SW-025	**27.1**		0.013	J	26200		0.095		3.14		6.8		4.1	J
SW-025	**29.7**		0.025		35000		0.111		2.71		**12.7**		6.8	
SW-026	**8.2**		< 0.008	U	24300		0.089		1.09		< 3.2	U	18.0	
SW-026	**9.1**		< 0.009	U	23400		0.110		1.20		2.4	J	21.2	
SW-028	1.8		< 0.008	U	28300		< 0.008	U	0.896		< 2.0	U	2.4	J
SW-028	0.6	J	< 0.009	U	36300		< 0.02	U	0.896		3.4	J	7.0	

Table 3.1-2: Surface Water Sampling Results – Total Fraction

	Selenium		Silver		Sodium		Thallium		Uranium		Vanadium		Zinc	
	7782-49-2		7440-22-4		7440-23-5		7440-28-0		7440-61-1		7440-62-2		7440-66-6	
	SW6020		SW6020		SW6010C		SW6020		SW6020		SW6010C		SW6010C	
	N/A		N/A		N/A		0.8		N/A		N/A		N/A	
	5		0.34		N/A		0.24		15900		8.1		120	
	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Site	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
SW-029	1.4		< 0.008	U	19600		< 0.008	U	1.79		3.4	J	2.2	J
SW-029	0.9	J	< 0.009	U	31100		< 0.009	U	1.32		6.8		2.2	J
SW-030	0.4	J	< 0.008	U	48900		< 0.008	U	0.92		1.8	J	1.5	J
SW-030	0.4	J	< 0.009	U	73500		< 0.009	U	0.751		4.5		4.7	
SW-031	0.5	J	< 0.008	U	15800		0.038		0.847		4.3		6.6	
SW-031	0.3	J	< 0.02	U	12400		< 0.02	U	0.777		2.7	J	< 4.2	U
SW-032	0.3	J	< 0.008	U	16600		< 0.008	U	0.817		2.8	J	0.9	J
SW-033	< 0.2	U	< 0.008	U	11600		< 0.008	U	0.312		3.9	J	7.9	
SW-033	< 0.2	U	0.015	J	13000		0.037		0.492		**10.1**		5.1	
SW-034	0.8	J	< 0.008	U	36300		< 0.008	U	1.17		1.4	J	1.1	J
SW-034	1.0	J	< 0.009	U	35300		0.027		0.973		1.1	J	0.5	J
SW-035	0.6	J	< 0.008	U	28100		< 0.008	U	1.19		2.4	J	1.3	J
SW-035	0.5	J	< 0.009	U	21300		< 0.009	U	1.25		2.5	J	1.4	J
SW-036	0.4	J	< 0.008	U	46000		< 0.013	U	1.51		< 2.3	U	0.9	J
SW-036	0.8	J	0.020		258000		0.028		1.54		**25.9**		16.6	
SW-037	2.5		0.015	J	35900		< 0.008	U	1.81		2.8	J	< 0.6	U
SW-037	2.5		< 0.008	U	35800		< 0.008	U	1.81		1.7	J	0.7	J
SW-037	0.7	J	< 0.02	U	45800		0.043		1.61		3.3	J	< 0.4	U
SW-038	3.5		< 0.008	U	36300		< 0.008	U	2.2		< 1.1	U	1.1	J
SW-038	3.5		< 0.009	U	32500		< 0.009	U	2.20		1.8	J	2.0	J
SW-039	3.0		< 0.008	U	38700		< 0.008	U	3.40		3.7	J	1.6	J
SW-039	3.8		< 0.02	U	45100		< 0.02	U	3.62		5.8		5.6	
SW-040	**46.2**		0.068		71000		0.03		5.19		5.1		21.6	
SW-040	**63.0**		< 0.02	U	74100		0.025		5.09		2.4	J	11.7	
SW-040	**63.4**		< 0.02	U	76300		0.024		5.11		2.4	J	12.3	
SW-041	1.9		**1.55**		5030		**0.294**		4.93		**141**		237	
SW-042	0.8	J	0.097		7560		0.045		2.49		**22.4**		48.7	
SW-043	2.3		< 0.008	U	75600		< 0.008	U	2.3		3.8	J	0.8	J
SW-043	2.3		0.134		78500		0.126		3.96		**50.2**		98.6	
SW-044	2.1		0.048		55500		< 0.008	U	7.53		5.9		6.5	
SW-045	2.5		**1.79**		1140		**0.437**		3.31		**138**		**261**	
SW-045	2.3		**1.76**		1090		**0.43**		3.12		**133**		**255**	
SW-046	1.6		0.011	J	29800		< 0.008	U	0.835		2	J	1.9	J
SW-047	0.9	J	< 0.008	U	39500		< 0.008	U	0.762		< 2.1	U	2.7	J
SW-048	**43.7**		< 0.008	U	70500		< 0.008	U	3.94		4.1	J	4.3	
SW-048	**28.8**		0.037		84800		0.046		3.83		**12.7**		29.4	
SW-049	2		< 0.008	U	16900		0.112		1.81		3.9	J	2.3	J
SW-049	2		< 0.008	U	16400		0.109		1.87		2.4	J	2.3	J
SW-049	2		< 0.009	U	15400		0.095		1.80		2.4	J	2.0	J

Notes:

335 Value is above the Ecological screening level
1.76 Value is above the Human Health screening level
43.7 Value is above both the Human Health and Ecological screening levels
1. Screening levels, minimum of sources presented in RA Approach (Appendix B to the RI Work Plan)
< - Result is not detected above the method detection limit (MDL)
CAS - Chemical Abstracts Service
J - Result is estimated, J+ denotes estimated value biased high
mg/l - milligram per liter
N/A - No Screening level available
QC - Quality Control
U - Result is not detected above the MDL
µg/L - microgram per liter
*Water source is upgradient of mining, but the dikes or dams that hold back the water are of unknown composition

Table 3.1-3: Surface Water Sampling Results – General Chemistry

						Analyte	A kalinity, Total		Bicarbonate		Carbonate (CO3)		Chloride	
						CAS #	ALK		71-52-3		3812-32-6		16887-00-6	
						Analysis Method	SM2320B		SM2320B		SM2320B		E300	
						Ecological Screening Level	20		N/A		N/A		230	
						Human Health Screening Level	N/A		N/A		N/A		N/A	
						Units	mg/l		mg/l		mg/l		mg/l	
Site	**Site Description**	**Sample Date**	**Sample QC**	**Position**	**Waterbody Type**	**Area**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
Blank	--	5/17/2018	Blank	--	--	--	< 1.0	U	< 1.0	U	< 1.0	U	< 0.03	U
Blank	--	5/22/2018	Blank	--	--	--	6	J	6	J	< 3	U	< 0.06	U
Blank	--	5/23/2018	Blank	--	--	--	6	J	6	J	< 3	U	< 0.03	U
Blank	--	9/13/2018	Blank	--	--	--	< 3	U	< 3	U	< 3	U	0.32	
Blank	--	9/18/2018	Blank	--	--	--	6	J	6	J	< 3	U	< 0.3	U
SW-002	Lincoln Creek below North Limb	5/23/2018		Creek	Downgradient	Northwest of North Limb	**132**		120		11	J	154	
SW-003	O, P Pit Lake	5/23/2018		Pit Lake	On disturbance	North Limb	**208**		189		19		55.3	
SW-003	O, P Pit Lake	9/20/2018		Pit Lake	On disturbance	North Limb	**89**		89		< 3	U	175	
SW-004A	Cattle Pond A above O, P Pit(near reclaimed area)	5/23/2018		Pond	On disturbance	North Limb	**112**		105		7	J	53.2	
SW-004A	Cattle Pond A above O, P Pit(near reclaimed area)	9/19/2018		Pond	On disturbance	North Limb	**183**		168		16		98.0	
SW-005	Lincoln Creek above North Limb	5/23/2018		Creek	Upgradient or Background	Northeast of North Limb	**242**		232		10	J	59.2	
SW-006	Covered Springs(on Lincoln Creek going to east)	5/22/2018		Spring	Upgradient or Background	Northeast of North Limb	**221**		221		< 3	U	26.3	
SW-006	Covered Springs(on Lincoln Creek going to east)	9/19/2018		Spring	Upgradient or Background	Northeast of North Limb	**224**		224		< 3	U	27.6	
SW-007	Bronco Springs (almost due east of K Pit)	5/22/2018		Spring	Upgradient or Background	East of North Limb	**220**		220		< 3	U	61.8	
SW-007	Bronco Springs (almost due east of K Pit)	9/19/2018		Spring	Upgradient or Background	East of North Limb	**221**		221		< 3	U	73.9	
SW-007	Bronco Springs (almost due east of K Pit)	9/19/2018	Duplicate	Spring	Upgradient or Background	East of North Limb	**216**		214		< 3	U	73.8	
SW-008	Cow Spring / Unnamed pond near cattle trough(above K Pit)	5/23/2018		Spring	On disturbance	North Limb	**209**		199		11	J	128	
SW-008	Cow Spring / Unnamed pond near cattle trough(above K Pit)	9/20/2018		Spring	On disturbance	North Limb	**161**		161		< 3	U	201	
SW-009	Source of Bunkhouse Spring	5/21/2018		Spring	Upgradient or Background	East of North Limb	**295**		295		< 3	U	214	
SW-010	Pond #3 / Main Holding Pond above A12 Pit	5/21/2018		Pond	Upgradient*	East of Southern Part of North Limb	**247**		229		19		194	
SW-010	Pond #3 / Main Holding Pond above A12 Pit	9/18/2018		Pond	Upgradient*	East of Southern Part of North Limb	**89**		70		18		**231**	
SW-011	Pond 1 above A12 Pit (East)	5/21/2018		Pond	On disturbance	Southern Part of North Limb	**215**		205		9	J	201	
SW-011	Pond 1 above A12 Pit (East)	9/18/2018		Pond	On disturbance	Southern Part of North Limb	**65**		29		36		**261**	
SW-012	Pond 2 above A12 Pit (West)	5/21/2018		Pond	On disturbance	Southern Part of North Limb	**214**		199		15	J	212	
SW-012	Pond 2 above A12 Pit (West)	9/18/2018		Pond	On disturbance	Southern Part of North Limb	**244**		244		< 3	U	**396**	
SW-013	A12 Lake in A12 Pit	5/21/2018		Pit Lake	On disturbance	Southern Part of North Limb	**191**		184		7	J	**231**	
SW-013	A12 Lake in A12 Pit	9/19/2018		Pit Lake	On disturbance	Southern Part of North Limb	**131**		131		< 3	U	224	
SW-014	Big Willow Springs	5/17/2018		Spring	On disturbance	Between South 40 and East Limb	**214**		214		< 1.0	U	151	
SW-014	Big Willow Springs	9/13/2018		Spring	On disturbance	Between South 40 and East Limb	**215**		215		< 3	U	171	
SW-015	Willow Creek (Upper Ross Fork Creek)	5/16/2018		Creek	Downgradient	South 40	**277**		268		9	J	189	
SW-015	Willow Creek (Upper Ross Fork Creek)	9/11/2018		Creek	Downgradient	South 40	**283**		283		< 3	U	199	
SW-016	Lake in JD/JF Pit	5/16/2018		Pit Lake	On disturbance	South 40	**252**		234		18		186	
SW-016	Lake in JD/JF Pit	9/12/2018		Pit Lake	On disturbance	South 40	**216**		200		16		202	
SW-018	Ross Fork Creek (downstream of Danielson Creek)	5/15/2018		Creek	On disturbance	West of South 40	**74**		74		< 3	U	12.2	
SW-018	Ross Fork Creek (downstream of Danielson Creek)	9/12/2018		Creek	On disturbance	West of South 40	**134**		134		< 3	U	24.8	
SW-018	Ross Fork Creek (downstream of Danielson Creek)	9/12/2018	Duplicate	Creek	On disturbance	West of South 40	**134**		134		< 3	U	24.2	
SW-019	Ross Fork above the Narrows	5/15/2018		Creek	On disturbance	West of South 40	**69**		69		< 3	U	6.83	
SW-019	Ross Fork above the Narrows	9/12/2018		Creek	On disturbance	West of South 40	**133**		131		< 3	U	11.4	
SW-020	Big Springs (spring only)	5/16/2018		Spring	Upgradient	South of South 40	**83**		83		< 3	U	1.88	
SW-020	Big Springs (spring only)	9/12/2018		Spring	Upgradient	South of South 40	**122**		122		< 3	U	2.95	
SW-021	Jeff Cabin Creek(water source for Falkner Ranch)	5/18/2018		Creek	Upgradient	South of East Limb & SE of South 40	**154**		154		< 3	U	6.73	
SW-021	Jeff Cabin Creek(water source for Falkner Ranch)	9/18/2018		Creek	Upgradient	South of East Limb & SE of South 40	**190**		185		4	J	9.6	
SW-022	Lower Big Jimmy Creek Spring(area feeding into Portneuf River)	5/18/2018		Creek	Upgradient or Background	East of South 40	**228**		228		< 3	U	54.7	
SW-022	Lower Big Jimmy Creek Spring(area feeding into Portneuf River)	9/18/2018		Creek	Upgradient or Background	East of South 40	**219**		213		6	J	36.7	
SW-023	Portneuf River (downstream of Bakers Creek)	5/18/2018		River	Downgradient	East of East Limb	**267**		267		< 3	U	50.4	
SW-023	Portneuf River (downstream of Bakers Creek)	9/17/2018		River	Downgradient	East of East Limb	**290**		280		10	J	34.1	
SW-024A	Portneuf River (above Bakers Creek)	5/18/2018		River	Downgradient	East of East Limb	**224**		207		18		56.2	
SW-024A	Portneuf River (above Bakers Creek)	9/17/2018		River	Downgradient	East of East Limb	**195**		178		17		30.7	
SW-025	Z Pit Lake	5/17/2018		Pit Lake	On disturbance	East Limb	**126**		120		6.0		47.8	
SW-025	Z Pit Lake	9/14/2018		Pit Lake	On disturbance	East Limb	**95**		53		42		69.5	
SW-026	Queedup Springs(by Lone Pine Canyon Road)	5/17/2018		Spring	Downgradient	East of East Limb	**469**		469		< 1.0	U	22.0	
SW-026	Queedup Springs(by Lone Pine Canyon Road)	9/13/2018		Spring	Downgradient	East of East Limb	**449**		449		< 3	U	23.2	
SW-028	Lone Pine Spring(Y Spring South, along Lone Pine Road)	5/17/2018		Spring	Upgradient	East of East Limb	**224**		224		< 1.0	U	137	

Table 3.1-3: Surface Water Sampling Results – General Chemistry

						Analyte	A kalinity, Total		Bicarbonate		Carbonate (CO3)		Chloride	
						CAS #	ALK		71-52-3		3812-32-6		16887-00-6	
						Analysis Method	SM2320B		SM2320B		SM2320B		E300	
						Ecological Screening Level	20		N/A		N/A		230	
						Human Health Screening Level	N/A		N/A		N/A		N/A	
						Units	mg/l		mg/l		mg/l		mg/l	
Site	**Site Description**	**Sample Date**	**Sample QC**	**Position**	**Waterbody Type**	**Area**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
SW-028	Lone Pine Spring(Y Spring South, along Lone Pine Road)	9/13/2018		Spring	Upgradient	East of East Limb	**281**		281		< 3	U	184	
SW-029	W Pit Lake	5/20/2018		Pit Lake	Downgradient	East Limb	**250**		232		18		3.44	
SW-029	W Pit Lake	9/14/2018		Pit Lake	Downgradient	East Limb	**206**		115		91		15.7	
SW-030	East Limb North Pond / Holding pond below Y intersection(above HH Pit)	5/20/2018		Pond	Upgradient*	West of East Limb	**227**		183		44		117	
SW-030	East Limb North Pond / Holding pond below Y intersection(above HH Pit)	9/14/2018		Pond	Upgradient*	West of East Limb	**130**		74		57		172	
SW-031	Portneuf River (above U Creek)	5/22/2018		River	Upgradient or Background	East of North Limb & NE East Limb	**211**		197		14	J	39.4	
SW-031	Portneuf River (above U Creek)	9/19/2018		River	Upgradient or Background	East of North Limb & NE East Limb	**197**		186		11	J	36.5	
SW-032	Red Rock Spring	5/22/2018		Spring	Upgradient or Background	East of North Limb	**217**		208		9	J	16.3	
SW-033	Mud Springs (north & east of mine, along road near Red Rock Spring)	5/22/2018		Spring	Upgradient or Background	East of North Limb	**164**		164		< 3	U	10	
SW-033	Mud Springs (north & east of mine, along road near Red Rock Spring)	9/19/2018		Spring	Upgradient or Background	East of North Limb	**204**		204		< 3	U	13.5	
SW-034	North Fork of Bakers Creek	5/18/2018		Creek	Downgradient	East of East Limb	**347**		347		< 3	U	41	
SW-034	North Fork of Bakers Creek	9/17/2018		Creek	Downgradient	East of East Limb	**347**		329		18		34.1	
SW-035	U Creek(above confluence with Portneuf River)	5/22/2018		Creek	Downgradient	East of North Limb	**246**		224		21		89.8	
SW-035	U Creek(above confluence with Portneuf River)	9/19/2018		Creek	Downgradient	East of North Limb	**233**		220		12	J	99.9	
SW-036	Seep and Pond below EE-2	5/17/2018		Spring	Downgradient	East Limb	**230**		226		4.0		111	
SW-036	Seep and Pond below EE-2	9/13/2018		Spring	Downgradient	East Limb	**191**		191		< 3	U	**942**	
SW-037	Willow Creek (Downstream of South 40 Area, upstream of Ross Fork Creek)	5/16/2018		Creek	Downgradient	South 40	**236**		236		< 3	U	11.9	J
SW-037	Willow Creek (Downstream of South 40 Area, upstream of Ross Fork Creek)	5/16/2018	Duplicate	Creek	Downgradient	South 40	**240**		240		< 3	U	187	J
SW-037	Willow Creek (Downstream of South 40 Area, upstream of Ross Fork Creek)	9/11/2018		Creek	Downgradient	West of South 40	**195**		195		< 3	U	N/S	
SW-038	Lincoln Peak Spring(Above and east of the M Pit area)	5/23/2018		Spring	Upgradient	East of North Limb	**236**		234		< 3	U	141	
SW-038	Lincoln Peak Spring(Above and east of the M Pit area)	9/20/2018		Spring	Upgradient	East of North Limb	**239**		239		< 3	U	146	
SW-039	Y Spring(Between SW-014 and SW-015)	5/16/2018		Spring	Downgradient	South 40	**311**		311		< 3	U	163	
SW-039	Y Spring(Between SW-014 and SW-015)	9/12/2018		Spring	Downgradient	South 40	**355**		355		< 3	U	167	
SW-040	Seep east of 11-2 Overburden Disposal Area (OBDA)	5/20/2018		Spring	On or near disturbance	East Limb	**411**		411		< 3	U	98	J
SW-040	Seep east of 11-2 Overburden Disposal Area (OBDA)	8/27/2018		Spring	On or near disturbance	East Limb	**412**		412		< 3	U	86.3	
SW-040	Seep east of 11-2 Overburden Disposal Area (OBDA)	9/13/2018		Spring	On or near disturbance	East Limb	**413**		413		< 3	U	89.3	
SW-041	Catch Basin northeast of 11-2 OBDA	5/20/2018		Spring	On or near disturbance	East Limb	**143**		143		< 3	U	22.5	
SW-042	Catch Basin northeast of AA-2 OBDA	5/20/2018		Spring	Downgradient	East Limb	**114**		103		10	J	12	
SW-043	Spring east of AA-2 OBDA	5/20/2018		Spring	Downgradient	East Limb	**308**		308		< 3	U	141	
SW-043	Spring east of AA-2 OBDA	9/13/2018		Spring	Downgradient	East Limb	**304**		304		< 3	U	181	
SW-044	Seep Area above and northeast of W Pit	5/20/2018		Spring	On disturbance	East Limb	**249**		249		< 3	U	4.62	
SW-045	BB-2 North Spring and Pond	5/20/2018		Spring	On disturbance	East Limb	**112**		112		< 3	U	1.52	
SW-045	BB-2 North Spring and Pond	5/20/2018	Duplicate	Spring	On disturbance	East Limb	**109**		109		< 3	U	1.48	
SW-046	Pond on Lone Pine Road	5/20/2018		Spring	Downgradient	East Limb	**203**		203		< 3	U	5.08	
SW-047	Seep and Pond below FF-2	5/17/2018		Spring	Downgradient	East Limb	**230**		230		< 1.0	U	198	
SW-048	Spring box below OBDA 11, downstream of SW-040	5/20/2018		Spring	Downgradient	East Limb	**406**		400		6	J	83.2	
SW-048	Spring box below OBDA 11, downstream of SW-040	9/13/2018		Spring	Downgradient	East Limb	**411**		387		23		111	
SW-049	Lincoln Creek(downstream of Yandell and Warm Springs)	5/23/2018		Creek	Downgradient	Northwest of North Limb	**191**		175		16		20	
SW-049	Lincoln Creek(downstream of Yandell and Warm Springs)	5/23/2018	Duplicate	Creek	Downgradient	Northwest of North Limb	**190**		174		16		19.4	
SW-049	Lincoln Creek(downstream of Yandell and Warm Springs)	9/20/2018		Creek	Downgradient	Northwest of North Limb	**196**		196		< 3	U	20.2	

Table 3.1-3: Surface Water Sampling Results – General Chemistry

	Nitrogen, Total Kjeldahl		pH		Sulfate		Total Dissolved Solids		Total Organic Carbon		Total Suspended Solids	
	KN		pH		14808-79-8		TDS		TOC		TSS	
	D1426		E150.1		E300		SM2540C		SM5310C		SM2540D	
	N/A		6.5 - 9		N/A		N/A		N/A		N/A	
	N/A		5 - 9		N/A		250		N/A		N/A	
	mg/l		pH units		mg/l		mg/l		mg/l		mg/l	
Site	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
Blank	0.45		6.58	J	< 0.01	U	< 5.0	U	< 0.07	U	< 5.0	U
Blank	0.49		**5.78**	J	< 0.02	U	12.7		0.23	J	< 5	U
Blank	0.38		6.07	J	< 0.01	U	< 5	U	0.25	J	< 5	U
Blank	0.38		**3.63**	J	< 0.02	U	15.5		< 0.07	U	< 5.0	U
Blank	0.09	J	6.21	J	< 0.1	Ui	46.2		0.1	J	< 5.0	U
SW-002	0.73		8.52	J	149		**569**		2.84		110	
SW-003	1.5		8.18	J	492		**1000**		7.05		21.5	
SW-003	< 0.04	U	8.20	J	964		**1780**		12.8		42.0	
SW-004A	0.7		8.52	J	27.2		**258**		4		7.5	
SW-004A	1.46		8.39	J	21.5		**409**		9.76		26.0	
SW-005	0.76		8.18	J	39.5		**392**		1.63		8	
SW-006	0.6	J+	8.08	J	8.48		**303**		0.68		5	
SW-006	< 0.04	U	8.01	J	9.1		**288**		0.81		< 5.0	U
SW-007	0.37		7.75	J	45.4		**406**		0.71		33	
SW-007	0.06	J	7.74	J	55.2		**418**		1.13		20.0	J
SW-007	< 0.04	U	7.87	J	55.3		**483**		1.22		45.0	J
SW-008	0.48		8.3	J	110		**593**		1.74		5	
SW-008	1.07		7.95	J	99.8		**711**		9.20		35.0	
SW-009	0.37		7.93	J	223		**864**		2.62		< 5	U
SW-010	0.6		8.42	J	192		**748**		5.03		< 5	U
SW-010	1.00		8.87		221		**752**		7.81		18.0	
SW-011	0.71		8.32	J	192		**803**		5.47		< 5	U
SW-011	0.87		**9.41**		214		**707**		7.28		< 5.0	U
SW-012	0.72		8.41	J	197		**769**		5.6		< 5	U
SW-012	3.38		8.29	J	186		**1070**		17.0		21.0	
SW-013	0.55		8.35	J	241		**825**		3.93		< 5	U
SW-013	0.34		8.24	J	230		**750**		3.79		< 5.0	U
SW-014	0.63		7.89	J	113		**652**		1.26		< 5.0	U
SW-014	1.61		7.46	J	122		**668**		0.95		7.0	
SW-015	< 0.04	U	8.32	J	99.0		**670**		2.62		21.5	
SW-015	0.76		8.29	J	105		**867**		2.85		89.0	
SW-016	< 0.04	U	8.44	J	120		**672**		2.82		< 5.0	U
SW-016	0.51		8.37	J	119		**759**		2.78		8.5	
SW-018	< 0.04	U	8.07	J	7.54		113		2.30		69.5	
SW-018	0.47	J	8.26	J	13.8		199		0.85		6.5	
SW-018	0.69	J	8.16	J	13.7		189		0.75		7.0	
SW-019	< 0.04	U	7.97	J	4.72		96.0		2.02		44.5	
SW-019	0.38		8.43	J	7.45		145		0.30	J	5.5	
SW-020	< 0.04	U	8.08	J	2.58		103		0.96		< 5.0	U
SW-020	0.48		7.98	J	4.55		115		< 0.07	U	12.0	
SW-021	0.58		8.18	J	5.02		163		1.57		10.5	
SW-021	0.46		8.31	J	6.5		**335**		0.72		11.0	
SW-022	1.28		7.78	J	10.1		**389**		15.2		18.5	
SW-022	0.91		8.29	J	13.9		**285**		2.16		5.5	
SW-023	0.89		8.24	J	87.9		**461**		3.29		< 5	U
SW-023	2.56		8.27	J	138		**622**		2.66		< 5.0	U
SW-024A	0.45		8.37	J	37		**366**		3.05		< 5	U
SW-024A	1.09		8.43	J	30.1		**273**		1.40		5.0	
SW-025	0.68	J+	8.61	J	127		**378**		2.84		8.0	
SW-025	0.58		**9.46**	J	148		**339**		3.75		7.0	
SW-026	0.47		7.43	J	184		**648**		0.65		< 5.0	U
SW-026	0.31		7.18	J	178		**655**		0.30	J	27.0	
SW-028	0.94		8.28	J	98.7		**619**		1.47		18.0	

Table 3.1-3: Surface Water Sampling Results – General Chemistry

	Nitrogen, Total Kjeldahl KN D1426 N/A N/A mg/l		pH pH E150.1 6.5 - 9 5 - 9 pH units		Sulfate 14808-79-8 E300 N/A N/A mg/l		Total Dissolved Solids TDS SM2540C N/A 250 mg/l		Total Organic Carbon TOC SM5310C N/A N/A mg/l		Total Suspended Solids TSS SM2540D N/A N/A mg/l	
Site	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
SW-028	0.46		7.91	J	115		**805**		2.16		121	
SW-029	0.85		8.43	J	2.44		**444**		7.14		< 5	U
SW-029	1.32		**9.45**	J	209		**427**		9.49		5.0	
SW-030	0.63		8.82	J	77		**516**		9.01		8	
SW-030	0.69		**9.47**	J	92.1		**513**		12.0		27.0	
SW-031	0.96		8.37	J	26.3		**336**		2.33		83.5	
SW-031	0.30		8.41	J	20.8		**321**		1.40		19.5	
SW-032	1.1		8.13	J	16		**283**		5.94		< 5	U
SW-033	0.81		7.81	J	6.8		226		3.58		20	
SW-033	0.28		8.09	J	10.0		**271**		1.80		274	
SW-034	0.42		8.25	J	211		**670**		3.94		< 5	U
SW-034	0.52		8.28	J	139		**643**		3.03		< 5.0	U
SW-035	0.78		8.31	J	62.7		**495**		2.76		10	
SW-035	0.36		8.32	J	59.3		**480**		2.99		17.5	
SW-036	0.89		8.46	J	108		**578**		5.64		< 5.0	U
SW-036	7.00		7.57	J	13.3		**1760**		64.2		142	
SW-037	< 0.04	U	8.19	J	8.4	J	**615**		3.36	J	6.5	
SW-037	< 0.04	U	8.26	J	98	J	**604**		2.47	J	< 5.0	U
SW-037	0.45		8.27	J	N/S		**754**		3.06		< 5.0	U
SW-038	0.53		7.88	J	122		**660**		1.11		13.5	
SW-038	< 0.04	U	8.01	J	122		**737**		1.28		17.5	
SW-039	0.31		8.13	J	142		**776**		4.43		5.5	
SW-039	0.64		7.73	J	149		**907**		2.88		84.0	
SW-040	0.69		7.38	J	225	J	**751**		2.32		8	
SW-040	0.48		7.74	J	194		**853**		2.44		< 5.0	U
SW-040	1.14	J+	7.49	J	194		**807**		1.74		14.5	
SW-041	5.58		8.01	J	15.6		**256**		11		22	
SW-042	2.6		8.88	J	21.1		193		10		126	
SW-043	0.89		7.69	J	212		**773**		2.48		13	
SW-043	2.72		7.60	J	173		**889**		3.90		1460	
SW-044	1.3		8.05	J	3.38		**274**		10.9		5.5	
SW-045	2.76	J	7.99	J	24.4		**257**		8.82		46	J
SW-045	3.4	J	8.03	J	25		**267**		8.71		26	J
SW-046	0.33		8.23	J	3.6		**579**		1.69		< 5	U
SW-047	0.64		8.34	J	122		**762**		3.03		6.0	
SW-048	0.69		8.16	J	180		**655**		2.81		23	
SW-048	1.90		8.19	J	196		**815**		4.28		266	
SW-049	0.49		8.39	J	180		**495**		< 0.07	U	35	
SW-049	0.51		8.38	J	177		**493**		< 0.07	U	30	
SW-049	< 0.04	U	8.28	J	181		**519**		0.39	J	19.0	

Notes:

5.9 Value is above the Human Health screening level

335 Value is above the Ecological screening level

335 Value is outside of the Human Heal h and the Ecological screening level range

1. Ecological and human heal h screening levels, minimum of sources presented in RA Approach (Appendix B to the RI Work Plan)

< - Result is not detected above the method detection limit (MDL)

CAS - Chemical Abstracts Service

i - The Method Reporting Limit/Method Detection Limit or Limit of Quantitation/Limit of Detec ion is elevated due to a matrix interference.

J - Result is estimated, J+ denotes estimated value biased high

mg/l - milligram per liter

N/A - No Screening level available

N/S - No sample result available due to lab error

QC - Quality Control

U - Result is not detected above the MDL

*Water source is upgradient of mining, but the dikes or dams that hold back the water are of unknown composition

Table 3.1-4: Surface Water Sampling Results – Field Parameters

					CHEMICAL_NAME	Conductivity	Dissolved Oxygen	Oxidation-Reduction Potential	pH	Temperature	Turbidity	Water Flow Rate
					RESULT_UNIT	µS/cm	mg/l	millivolts	pH units	C	ntu	cfs
					Ecological Screening Level	400	N/A	N/A	6.5 - 9	N/A	N/A	N/A
					Human Health Screening Level	N/A	N/A	N/A	5 - 9	N/A	N/A	N/A
Site	**Site Description**	**Sample Date**	**Position**	**Waterbody Type**	**Area**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
SW-002	Lincoln Creek below North Limb	23 May 2018	Creek	Downgradient	North Limb	**785**	7.81	166.9	8.59	20.6	87.1	--
SW-003	O, P Pit Lake	23 May 2018	Pit Lake	On disturbance	North Limb	**999**	9.06	189.9	7.84	15.8	11.9	--
SW-004A	Cattle Pond A above O, P Pit(near reclaimed area)	23 May 2018	Pond	On disturbance	North Limb	335	16.13	151.6	8.89	17.4	4.54	--
SW-005	Lincoln Creek above North Limb	23 May 2018	Creek	Upgradient or Background	North Limb	**463**	8.22	152.6	7.89	11.7	11.2	--
SW-006	Covered Springs(on Lincoln Creek going to east)	22 May 2018	Spring	Upgradient or Background	Northeast of North Limb	302	8.31	171.8	7.60	8.3	2.33	--
SW-007	Bronco Springs (almost due east of K Pit)	22 May 2018	Spring	Upgradient or Background	East of North Limb	**419**	8.77	218.7	7.58	7.2	1.27	--
SW-008	Cow Spring / Unnamed pond near cattle trough(above K Pit	23 May 2018	Spring	On disturbance	East of North Limb	**718**	8.58	222.6	7.83	13.9	3.64	--
SW-009	Source of Bunkhouse Spring	21 May 2018	Spring	Upgradient or Background	East of Southern Part of North Limb	**871**	8.86	156.7	7.53	7.6	0.38	--
SW-010	Pond #3 / Main Holding Pond above A12 Pit	21 May 2018	Pond	Upgradient*	East of Southern Part of North Limb	**950**	10.21	164.2	8.13	15.1	2.22	--
SW-011	Pond 1 above A12 Pit (East)	21 May 2018	Pond	On disturbance	Southern Part of North Limb	**956**	10.39	160.5	7.97	15.5	3.34	--
SW-012	Pond 2 above A12 Pit (West)	21 May 2018	Pond	On disturbance	Southern Part of North Limb	**982**	9.85	168.4	8.25	16.0	5.75	--
SW-013	A12 Lake in A12 Pit	21 May 2018	Pit Lake	On disturbance	Southern Part of North Limb	**1015**	12.36	186.2	8.41	16.6	2.38	--
SW-014	Big Willow Springs	17 May 2018	Spring	On disturbance	Between South 40 and East Limb	**724**	7.78	2	7.62	8.3	0.54	--
SW-015	Willow Creek (Upper Ross Fork Creek)	16 May 2018	Creek	Downgradient	South 40	**844**	9.44	146.8	8.21	12.4	14.2	--
SW-016	Lake in JD/JF Pit	16 May 2018	Pit Lake	On disturbance	South 40	**911**	9.51	192.7	8.27	13.8	3.35	--
SW-018	Ross Fork Creek (downstream of Danielson Creek)	15 May 2018	Creek	On disturbance	West of South 40	132	9.22	211.7	7.92	10.0	41.3	41.18
SW-019	Ross Fork above the Narrows	15 May 2018	Creek	On disturbance	West of South 40	109	9.24	200.2	8.05	10.0	27.0	36.6
SW-020	Big Springs (spring only)	16 May 2018	Spring	Upgradient	South of South 40	107	10.08	167.6	8.13	6.6	5.52	34.5
SW-021	Jeff Cabin Creek(water source for Falkner Ranch)	18 May 2018	Creek	Upgradient	South of East Limb & SE of South 40	218	8.69	116.7	8.24	12.0	11.4	4.57
SW-022	Lower Big Jimmy Creek Spring(area feeding into Portneuf R	18 May 2018	Creek	Upgradient or Background	East of South 40	**446**	5.62	38.9	7.55	13.8	13.2	--
SW-023	Portneuf River (downstream of Bakers Creek)	18 May 2018	River	Downgradient	East of East Limb	**543**	10.33	205.7	8.04	10.8	4.20	8.8
SW-024A	Portneuf River (above Bakers Creek)	18 May 2018	River	Downgradient	East of East Limb	**496**	10.84	110.7	8.34	15.0	6.52	12.2
SW-025	Z Pit Lake	17 May 2018	Pit Lake	On disturbance	East Limb	**495**	9.87	191.4	8.64	14.3	2.47	--
SW-026	Queedup Springs(by Lone Pine Canyon Road)	17 May 2018	Spring	Downgradient	East of East Limb	**981**	2.47	206.0	6.86	17.8	0.40	--
SW-028	Lone Pine Spring(Y Spring South, along Lone Pine Road)	17 May 2018	Spring	Upgradient	East Limb	**676**	8.85	159.0	8.00	7.9	9.98	--
SW-029	W Pit Lake	20 May 2018	Pit Lake	Downgradient	East Limb	**586**	10.56	86.8	8.38	15.9	2.84	--
SW-030	East Limb North Pond / Holding pond below Y intersection(a	20 May 2018	Pond	Upgradient*	West of East Limb	**758**	17.00	129.9	8.77	18.7	19.0	--
SW-031	Portneuf River (above U Creek)	21 May 2018	River	Upgradient or Background	East of North Limb & NE East Limb	398	8.42	217.4	8.27	14.0	32.3	2.3
SW-032	Red Rock Spring	22 May 2018	Spring	Upgradient or Background	East of North Limb	346	8.07	172.4	8.11	14.6	9.06	--
SW-033	Mud Springs (north & east of mine, along road near Red Ro	22 May 2018	Spring	Upgradient or Background	East of North Limb	245	7.09	120.4	7.60	13.5	42.9	--
SW-034	North Fork of Bakers Creek	18 May 2018	Creek	Downgradient	East of East Limb	**742**	10.66	123.3	8.13	11.1	1.69	2.72
SW-035	U Creek(above confluence with Portneuf River)	22 May 2018	Creek	Downgradient	East of North Limb	**607**	8.77	205.8	8.22	14.3	9.54	--
SW-036	Seep and Pond below EE-2	17 May 2018	Spring	Downgradient	East Limb	**784**	10.59	192.7	8.44	16.9	2.34	--
SW-037	Willow Creek (Downstream of South 40 Area, upstream of R	16 May 2018	Creek	Downgradient	South 40	**783**	10.63	237.7	8.16	8.7	2.02	--
SW-038	Lincoln Peak Spring(Above and east of the M Pit area)	23 May 2018	Spring	Upgradient	East of North Limb	**642**	9.42	107.2	7.74	7.4	4.50	--
SW-039	Y Spring(Between SW-014 and SW-015)	16 May 2018	Spring	Downgradient	South 40	**951**	6.60	146.2	7.68	12.6	7.40	--
SW-040	Seep east of 11-2 Overburden Disposal Area (OBDA)	20 May 2018	Spring	On or near disturbance	East Limb	**827**	6.78	170.2	7.17	10.2	15.5	--
SW-041	Catch Basin northeast of 11-2 OBDA	20 May 2018	Spring	On or near disturbance	East Limb	331	4.63	85.0	7.75	20.5	151	--
SW-042	Catch Basin northeast of AA-2 OBDA	20 May 2018	Spring	Downgradient	East Limb	231	10.03	156.8	8.99	16.3	180	--
SW-043	Spring east of AA-2 OBDA	20 May 2018	Spring	Downgradient	East Limb	**903**	18.34	194.7	7.54	10.3	8.62	--
SW-044	Seep Area above and northeast of W Pit	20 May 2018	Spring	On disturbance	East Limb	374	11.45	178.6	8.15	15.5	11.3	--
SW-045	BB-2 North Spring and Pond	20 May 2018	Spring	On disturbance	East Limb	246	6.52	110.6	8.19	24.3	188	--
SW-046	Pond on Lone Pine Road	20 May 2018	Spring	Downgradient	East Limb	**705**	9.35	219.8	8.04	11.8	2.97	--
SW-047	Seep and Pond below FF-2	17 May 2018	Spring	Downgradient	East Limb	**1002**	10.97	191.1	8.24	15.6	8.12	--
SW-048	Spring box below OBDA 11, downstream of SW-040	20 May 2018	Spring	Downgradient	East Limb	**940**	8.42	156.8	8.11	15.0	9.74	--
SW-049	Lincoln Creek(downstream of Yandell and Warm Springs)	23 May 2018	Creek	Downgradient	Northwest of North Limb	**644**	7.63	115.6	8.29	23.4	26.2	17.31
SW-003	O, P Pit Lake	20 Sept 2018	Pit Lake	On disturbance	North Limb	**1635**	8.17	215.7	8.22	16.0	11.4	--
SW-004A	Cattle Pond A above O, P Pit(near reclaimed area)	19 Sept 2018	Pond	On disturbance	North Limb	**512**	12.74	131.5	8.12	16.4	18.3	--
SW-006	Covered Springs(on Lincoln Creek going to east)	19 Sept 2018	Spring	Upgradient or Background	Northeast of North Limb	327	8.14	93.1	7.38	8.9	0.53	--

Table 3.1-4: Surface Water Sampling Results – Field Parameters

					CHEMICAL_NAME	Conductivity	Dissolved Oxygen	Oxidation-Reduction Potential	pH	Temperature	Turbidity	Water Flow Rate
					RESULT_UNIT	µS/cm	mg/l	millivolts	pH units	C	ntu	cfs
					Ecological Screening Level	400	N/A	N/A	6.5 - 9	N/A	N/A	N/A
					Human Health Screening Level	N/A	N/A	N/A	5 - 9	N/A	N/A	N/A
Site	**Site Description**	**Sample Date**	**Position**	**Waterbody Type**	**Area**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
SW-007	Bronco Springs (almost due east of K Pit)	19 Sept 2018	Spring	Upgradient or Background	East of North Limb	**452**	7.78	132.4	7.40	8.7	41.6	--
SW-008	Cow Spring / Unnamed pond near cattle trough(above K Pit)	20 Sept 2018	Spring	On disturbance	East of North Limb	**671**	5.84	171.4	7.83	15.0	13.4	--
SW-010	Pond #3 / Main Holding Pond above A12 Pit	18 Sept 2018	Pond	Upgradient*	East of Southern Part of North Limb	**932**	10.42	147.5	8.77	14.9	1.35	--
SW-011	Pond 1 above A12 Pit (East)	18 Sept 2018	Pond	On disturbance	Southern Part of North Limb	**1021**	12.46	159.6	**9.29**	16.9	1.32	--
SW-012	Pond 2 above A12 Pit (West)	18 Sept 2018	Pond	On disturbance	Southern Part of North Limb	**1486**	6.75	140.6	8.15	17.6	34.2	--
SW-013	A12 Lake in A12 Pit	19 Sept 2018	Pit Lake	On disturbance	Southern Part of North Limb	**1007**	4.99	-153.3	7.61	14.5	1.27	--
SW-014	Big Willow Springs	13 Sept 2018	Spring	On disturbance	Between South 40 and East Limb	**688**	8.02	235.6	7.29	8.4	2.09	--
SW-015	Willow Creek (Upper Ross Fork Creek)	11 Sept 2018	Creek	Downgradient	South 40	**1063**	7.97	184.1	8.05	19.2	281	--
SW-016	Lake in JD/JF Pit	12 Sept 2018	Pit Lake	On disturbance	South 40	**894**	11.21	189.0	8.03	17.0	4.45	--
SW-018	Ross Fork Creek (downstream of Danielson Creek)	12 Sept 2018	Creek	On disturbance	West of South 40	218	9.57	236.1	8.39	8.2	4.26	30.5
SW-019	Ross Fork above the Narrows	12 Sept 2018	Creek	On disturbance	West of South 40	177	9.69	221.1	8.34	8.7	2.44	9.16
SW-020	Big Springs (spring only)	12 Sept 2018	Spring	Upgradient	South of South 40	80	9.37	191.4	7.80	8.3	19.2	6.5
SW-021	Jeff Cabin Creek(water source for Falkner Ranch)	18 Sept 2018	Creek	Upgradient	South of East Limb & SE of South 40	261	9.10	221.1	8.18	10.8	4.84	2.96
SW-022	Lower Big Jimmy Creek Spring(area feeding into Portneuf R	18 Sept 2018	Creek	Upgradient or Background	East of South 40	**438**	8.04	193.5	8.22	18.9	3.01	--
SW-023	Portneuf River (downstream of Bakers Creek)	17 Sept 2018	River	Downgradient	East of East Limb	**490**	10.72	259.5	8.16	8.1	13.0	5.90
SW-024A	Portneuf River (above Bakers Creek)	17 Sept 2018	River	Downgradient	East of East Limb	321	11.68	162.6	8.57	12.8	8.11	1.05
SW-025	Z Pit Lake	14 Sept 2018	Pit Lake	On disturbance	East Limb	**491**	10.67	191.0	**9.54**	19.0	5.51	--
SW-026	Queedup Springs(by Lone Pine Canyon Road)	13 Sept 2018	Spring	Downgradient	East of East Limb	**822**	2.18	106.5	6.67	16.9	0.55	--
SW-028	Lone Pine Spring(Y Spring South, along Lone Pine Road)	13 Sept 2018	Spring	Upgradient	East Limb	**904**	8.52	78.7	7.48	15.9	26.3	--
SW-029	W Pit Lake	14 Sept 2018	Pit Lake	Downgradient	East Limb	**526**	15.24	175.4	**9.58**	18.2	5.35	--
SW-030	East Limb North Pond / Holding pond below Y intersection(a	14 Sept 2018	Pond	Upgradient*	West of East Limb	**696**	15.03	106.6	**9.30**	20.1	11.0	--
SW-031	Portneuf River (above U Creek)	19 Sept 2018	River	Upgradient or Background	East of North Limb & NE East Limb	332	9.85	72.3	8.26	9.5	9.72	1.37
SW-033	Mud Springs (north & east of mine, along road near Red Ro	19 Sept 2018	Spring	Upgradient or Background	East of North Limb	272	5.24	63.5	7.59	8.8	40.9	--
SW-034	North Fork of Bakers Creek	17 Sept 2018	Creek	Downgradient	East of East Limb	**639**	11.77	206.3	8.32	9.7	1.78	3.82
SW-035	U Creek(above confluence with Portneuf River)	19 Sept 2018	Creek	Downgradient	East of North Limb	**581**	11.29	102.5	8.11	12.7	19.0	--
SW-036	Seep and Pond below EE-2	13 Sept 2018	Spring	Downgradient	East Limb	**2352**	6.13	40.4	7.42	16.2	606	--
SW-037	Willow Creek (Downstream of South 40 Area, upstream of R	11 Sept 2018	Creek	Downgradient	South 40	**1011**	9.66	142.3	8.02	21.3	7.69	--
SW-038	Lincoln Peak Spring(Above and east of the M Pit area)	20 Sept 2018	Spring	Upgradient	East of North Limb	**656**	9.28	176.9	7.86	7.9	28.3	--
SW-039	Y Spring(Between SW-014 and SW-015)	12 Sept 2018	Spring	Downgradient	South 40	**896**	5.33	92.4	7.33	12.2	76.70	--
SW-040	Seep east of 11-2 Overburden Disposal Area (OBDA)	13 Sept 2018	Spring	On or near disturbance	East Limb	**815**	5.30	14.3	7.12	10.5	38.9	--
SW-043	Spring east of AA-2 OBDA	13 Sept 2018	Spring	Downgradient	East Limb	**926**	6.32	32.8	7.32	13.4	947	--
SW-048	Spring box below OBDA 11, downstream of SW-040	13 Sept 2018	Spring	Downgradient	East Limb	**911**	7.35	49.7	8.14	14.0	170	--
SW-049	Lincoln Creek(downstream of Yandell and Warm Springs)	20 Sept 2018	Creek	Downgradient	Northwest of North Limb	**600**	7.98	230.3	8.06	19.3	6.89	14.34

Notes:

5.9	Value is above the Human Health screening level
335	Value is above the Ecological screening level (or below the lower range for pH)
335	Value is above both screening levels

1. Ecological and human health screening levels, minimum of sources presented in RA Approach (Appendix B to the RI Work Plan)

cfs - cubic feet per second

mg/l - milligram per liter

N/A - No Screening level available

Table 3.2-1: Groundwater Sampling Results – Analytical Results

			Analyte	Alkalinity, Bicarbonate as		Alkalinity, Carbonate as		Alkalinity, Total		Hardness, Calcium Carbonate		Aluminum		Antimony		Arsenic		Barium		Beryllium	
			CAS #	ALKB-C		ALKC-C		ALK		HARDCA		7429-90-5		7440-36-0		7440-38-2		7440-39-3		7440-41-7	
			Analysis Method	SM2320B		SM2320B		SM2320B		SM2340B		SW6010C		SW6020		SW6020		SW6010C		SW6010C	
			Units	mg/l		mg/l		mg/l		mg/l		µg/L		µg/L		µg/L		µg/L		µg/L	
			Human Health Ground Water Screening Level [1]	N/A		N/A		N/A		N/A		200		0.78		0.052		380		2.5	
			Maximum Contaminant Level (MCL) [2]	N/A		N/A		N/A		N/A		N/A		6		10		2000		4	
Location	**Sample Date**	**Fraction**	**Sample Type**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
Deep Wells - East Limb Area																					
EL-01	29 Aug 2018	D	N	253		< 3	U	253		302		< 4	U	0.248		**0.18**	J	129		< 0.2	U
EL-01	29 Aug 2018	T	N	260		< 3	U	260		310		97		0.221		**0.25**	J	151		< 0.2	U
MW-EL-02	18 Oct 2018	D	N	< 3	U	54		359		452		< 4	U	0.253		**0.18**	J	**1120**		< 0.2	U
MW-EL-02	18 Oct 2018	T	N	< 3	U	32		610		627		28		0.243		**0.39**	J	**1380**		< 0.2	U
MW-EL-03	17 Oct 2018	D	N	249		< 3	U	249		352		< 4	U	0.533		**18.8**		56.2		< 0.2	U
MW-EL-03	17 Oct 2018	T	N	248		< 3	U	248		345		7	J	0.538		**25.0**		56.9		< 0.2	U
Deep Wells - South 40 Area																					
MW-S40-1	20 Oct 2018	D	N	361		< 3	U	361		533		< 4	U	0.147		**0.75**		61.1		< 0.2	U
MW-S40-1	20 Oct 2018	T	N	363		< 3	U	363		536		5	J	0.123		**0.88**		62.3		< 0.2	U
MW-S40-2	20 Oct 2018	D	N	269		< 3	U	269		422		< 4	U	0.063		**0.87**		101		< 0.2	U
MW-S40-2	20 Oct 2018	D	FD	266		< 3	U	266		421		20		0.070		**0.86**		100		< 0.2	U
MW-S40-2	20 Oct 2018	T	N	267		< 3	U	267		423		< 4	U	0.080		**0.81**		102		< 0.2	U
MW-S40-2	20 Oct 2018	T	FD	268		< 3	U	268		422		< 4	U	0.094		**0.89**		101		< 0.2	U
MW-S40-3	19 Oct 2018	D	N	162		3	J	165		166		< 4	U	0.127		**1.16**		107		< 0.2	U
MW-S40-3	19 Oct 2018	T	N	161		3	J	164		160		< 4	U	0.148		**1.46**		98.8		< 0.2	U
Deep Wells - SPNL Area																					
MW-SPNL-1	22 Oct 2018	D	N	215		< 3	U	215		233		< 4	U	0.191		**0.67**		96.1		< 0.2	U
MW-SPNL-1	22 Oct 2018	T	N	214		< 3	U	214		233		< 4	U	0.027	J	**0.74**		94.6		< 0.2	U
MW-SPNL-3	22 Oct 2018	D	N	183		4	J	187		176		< 4	U	0.217		**1.16**		66.3		< 0.2	U
MW-SPNL-3	22 Oct 2018	T	N	181		3	J	184		176		6	J	0.175		**1.10**		65.9		< 0.2	U
QC Data - Blanks																					
Field Blank	22 Oct 2018	D	FB	6	J	< 3	U	6	J	0.054	J	< 4	U	< 0.020	U	< 0.08	U	< 0.6	U	< 0.2	U
Field Blank	22 Oct 2018	T	FB	6	J	< 3	U	6	J	0.094		< 4	U	< 0.020	U	< 0.08	U	< 0.6	U	< 0.2	U

Table 3.2-1: Groundwater Sampling Results – Analytical Results

Analyte				Boron		Cadmium		Calcium		Chloride		Chromium		Chromium (III)		Hexavalent Chromium		Cobalt		Copper	
CAS #				7440-42-8		7440-43-9		7440-70-2		16887-00-6		7440-47-3		16065-83-1		18540-29-9		7440-48-4		7440-50-8	
Analysis Method				SW6020		SW6020		SW6010C		E300		SW6010C		DIFFERENCE CALC		E218.6		SW6020		SW6010C	
Units				µg/L		µg/L		µg/L		mg/l		µg/L		µg/L		µg/L		µg/L		µg/L	
Human Health Ground Water Screening Level [1]				400		0.92		N/A		250		100		100		0.035		0.6		80	
Maximum Contaminant Level (MCL) [2]				N/A		5		N/A		250		100		N/A		N/A		N/A		1300 (1000 Secondary)	
Location	**Sample Date**	**Fraction**	**Sample Type**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
Deep Wells - East Limb Area																					
EL-01	29 Aug 2018	D	N	180		< 0.02	J	63700				< 0.6	U	< 0.6	U	**0.042**		0.329		< 0.9	U
EL-01	29 Aug 2018	T	N	184		< 0.02	J	66600		55		< 0.6	U	< 0.6	U	0.033		0.426		< 0.9	U
MW-EL-02	18 Oct 2018	D	N	11.2		0.014	J	181000				13.5		< 0.6	UJ	**15.0**	J	0.094		< 0.9	U
MW-EL-02	18 Oct 2018	T	N	12.6		0.019	J	247000		6.35		15.6		< 0.6	UJ	**16.8**	J	0.104		< 0.9	U
MW-EL-03	17 Oct 2018	D	N	30.1		0.073		91000				< 0.6	U	< 0.6	UJ	**0.381**	J	0.624		< 0.9	U
MW-EL-03	17 Oct 2018	T	N	31.3		0.059		87600		89.3		< 0.6	U	< 0.6	UJ	**3.18**	J	0.610		< 0.9	U
Deep Wells - South 40 Area																					
MW-S40-1	20 Oct 2018	D	N	46.5		0.083		121000				< 0.6	U	< 0.6	UJ	0.030	J	1.31		4.7	
MW-S40-1	20 Oct 2018	T	N	46.9		0.039		121000		143		1.5	J	1.5		0.013	J	1.21		7.2	
MW-S40-2	20 Oct 2018	D	N	74.2		0.016	J	113000				< 0.6	U	< 0.6	UJ	**0.488**	J	1.12		< 0.9	U
MW-S40-2	20 Oct 2018	D	FD	75.4		0.012	J	113000				< 0.6	U	< 0.6	UJ	**0.470**	J	1.10		< 0.9	U
MW-S40-2	20 Oct 2018	T	N	73.2		< 0.009	U	112000		155		5.4		4.9	J	**0.454**	J	1.22		< 0.9	U
MW-S40-2	20 Oct 2018	T	FD	72.9		0.012	J	113000		161		5.7		5.2	J	**0.459**	J	1.22		< 0.9	U
MW-S40-3	19 Oct 2018	D	N	20.3		0.015	J	33800				< 0.6	U	< 0.6	UJ	**0.054**	J	0.237		< 0.9	U
MW-S40-3	19 Oct 2018	T	N	21.6		0.020	J	31400		16.6		< 0.6	U	< 0.6	UJ	**0.037**	J	0.220		< 0.9	U
Deep Wells - SPNL Area																					
MW-SPNL-1	22 Oct 2018	D	N	28.2		0.019	J	57600				1.8	J	< 0.6	UJ	**2.32**	J	0.287		< 0.9	U
MW-SPNL-1	22 Oct 2018	T	N	28.8		< 0.009	U	58400		35.4		3.3	J	1.0	J	**2.34**	J	0.130		< 0.9	U
MW-SPNL-3	22 Oct 2018	D	N	33.5		0.019	J	34300				0.8	J	0.7	J	**0.093**	J	0.311		< 0.9	U
MW-SPNL-3	22 Oct 2018	T	N	34.2		< 0.02	J	34700		28.2		< 0.6	U	< 0.6	UJ	**0.037**	J	0.195		1.7	J
QC Data - Blanks																					
Field Blank	22 Oct 2018	D	FB	< 0.5	U	< 0.009	U	17	J			< 0.6	U	< 0.6	U	0.033		0.008	J	< 0.9	U
Field Blank	22 Oct 2018	T	FB	< 0.5	U	0.015	J	26		< 0.03	U	< 0.6	U	< 0.6	U	**0.045**		< 0.005	U	< 0.9	U

Table 3.2-1: Groundwater Sampling Results – Analytical Results

Analyte				Iron		Lead		Magnesium		Manganese		Mercury		Molybdenum		Nickel		Nitrogen, Nitrate-Nitrite		Nitrogen, Total Kjeldahl		pH	
CAS #				7439-89-6		7439-92-1		7439-95-4		7439-96-5		7439-97-6		7439-98-7		7440-02-0		NO3NO2N		KN		pH	
Analysis Method				SW6010C		SW6020		SW6010C		SW6010C		SW7470		SW6010C		SW6010C		E353.2		E351.4 / D1426		SW9040C	
Units				µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		mg/l		mg/l		pH units	
Human Health Ground Water Screening Level [1]				300		15		N/A		43		0.063		10		39		N/A		N/A		5 - 9	
Maximum Contaminant Level (MCL) [2]				300 (Secondary)		15		N/A		50 (Secondary)		2		N/A		N/A		10		N/A		6.5-8.5 (Secondary)	
Location	**Sample Date**	**Fraction**	**Sample Type**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
Deep Wells - East Limb Area																							
EL-01	29 Aug 2018	D	N	**368**		< 0.02	J	34700		**289**		< 0.02	U	< 4.2	U	1.1	J						
EL-01	29 Aug 2018	T	N	**5400**		0.047		34800		**323**		< 0.02	U	< 4.2	U	1.3	J	5.34		2.18		8.01	J
MW-EL-02	18 Oct 2018	D	N	< 3	U	0.024		101		< 0.07	U	< 0.02	U	9.6	J	< 0.4	U						
MW-EL-02	18 Oct 2018	T	N	3	J	0.044		2430		< 1.1	U	< 0.02	U	5.0		< 0.4	U	1.13		0.79		**12.1**	J
MW-EL-03	17 Oct 2018	D	N	**669**		0.013	J	30200		**97.1**		< 0.02	U	**328**		10.6							
MW-EL-03	17 Oct 2018	T	N	**924**		0.010	J	30700		**105**		< 0.02	U	**318**		10.6		< 0.05	U	4.46		7.82	J
Deep Wells - South 40 Area																							
MW-S40-1	20 Oct 2018	D	N	124		0.007	J	56100		40.1		< 0.02	U	6.5		24.2							
MW-S40-1	20 Oct 2018	T	N	**363**		0.014	J	56800		36.3		< 0.02	U	6.7		21.2		< 0.05	U	0.17	J	7.83	J
MW-S40-2	20 Oct 2018	D	N	5	J	< 0.007	U	34000		7.7		0.03	J	< 4.2	U	**43.9**							
MW-S40-2	20 Oct 2018	D	FD	7	J	0.010	J	33700		7.7		< 0.02	U	< 4.2	U	**43.6**							
MW-S40-2	20 Oct 2018	T	N	146		< 0.007	U	34700		9.3		< 0.02	U	< 4.2	U	**48.5**		0.498		0.22		7.85	J
MW-S40-2	20 Oct 2018	T	FD	140		0.008	J	34000		9.3		< 0.02	U	< 4.2	U	**48.8**		0.462		0.23		7.85	J
MW-S40-3	19 Oct 2018	D	N	8	J	0.008	J	19700		19.7		< 0.02	U	**12.1**		6.1							
MW-S40-3	19 Oct 2018	T	N	56		0.011	J	19700		16.7		< 0.02	U	**12.1**		6.7		< 0.05	U	0.21		8.38	J
Deep Wells - SPNL Area																							
MW-SPNL-1	22 Oct 2018	D	N	3	J	0.021		21600		1.2		< 0.02	U	< 4.2	U	5.4							
MW-SPNL-1	22 Oct 2018	T	N	27		0.013	J	21100		1.3		< 0.02	U	< 4.2	U	5.6		0.414		0.26		7.94	J
MW-SPNL-3	22 Oct 2018	D	N	< 3	U	0.015	J	21900		35.1		< 0.02	U	**17.6**		8.2							
MW-SPNL-3	22 Oct 2018	T	N	123		0.025		21600		35.6		< 0.02	U	**18.0**		8.4		< 0.05	U	< 0.2	U	8.34	J
QC Data - Blanks																							
Field Blank	22 Oct 2018	D	FB	< 3	U	< 0.007	U	2.9	J	< 0.07	U	< 0.02	U	< 0.5	U	< 0.4	U						
Field Blank	22 Oct 2018	T	FB	< 3	U	< 0.007	U	7.1		< 0.07	U	< 0.02	U	< 0.5	U	< 0.4	U	0.033	J	0.19	J	5.76	J

Table 3.2-1: Groundwater Sampling Results – Analytical Results

			Analyte	Phosphate		Phosphorus		Potassium		Selenium		Silver		Sodium		Sulfate		Thallium		Total Dissolved Solids		Total Organic Carbon	
			CAS #	14265-44-2		7723-14-0		7440-09-7		7782-49-2		7440-22-4		7440-23-5		14808-79-8		7440-28-0		TDS		TOC	
			Analysis Method	E365.3		E365.3		SW6010C		SW6020		SW6020		SW6010C		E300		SW6020		SM2540C		SM5310C	
			Units	mg/l		mg/l		µg/L		µg/L		µg/L		µg/L		mg/l		µg/L		mg/l		mg/l	
			Human Health Ground Water Screening Level [1]	N/A		N/A		N/A		10		9.4		N/A		250		0.02		500		N/A	
			Maximum Contaminant Level (MCL) [2]	N/A		N/A		N/A		50		100		N/A		N/A		2		N/A		N/A	
Location	**Sample Date**	**Fraction**	**Sample Type**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**	**Result**	**Qualifier**
Deep Wells - East Limb Area																							
EL-01	29 Aug 2018	D	N	< 0.004	U	< 0.004	U	4200		**176**		< 0.02	U	64900				< 0.2	U				
EL-01	29 Aug 2018	T	N	< 0.004	U	0.014		4160		**178**		< 0.02	U	64400		107		< 0.008	U	**5010**		1.84	
MW-EL-02	18 Oct 2018	D	N	< 0.004	U	< 0.004	U	8890		**52.5**		< 0.02	U	15700				**0.116**					
MW-EL-02	18 Oct 2018	T	N	< 0.004	U	0.004	J	9050		**47.5**		< 0.02	U	17400		41.2		**0.119**		**721**		2.29	
MW-EL-03	17 Oct 2018	D	N	0.005	J	0.006	J	2290		1.2		< 0.02	U	22000				< 0.02	U				
MW-EL-03	17 Oct 2018	T	N	0.004	J	0.009	J	2300		1.2		< 0.02	U	22700		73.2		< 0.02	U	459		1.43	
Deep Wells - South 40 Area																							
MW-S40-1	20 Oct 2018	D	N	< 0.004	UJ	0.009	J	1950		5.9		< 0.002	U	28300				**0.046**					
MW-S40-1	20 Oct 2018	T	N	0.007	J	0.011		2000		3.1		< 0.002	U	28700		92		< 0.02	U	**745**		1.03	
MW-S40-2	20 Oct 2018	D	N	0.021	J	0.020		1700		3.2		< 0.002	U	52300				< 0.008	U				
MW-S40-2	20 Oct 2018	D	FD	0.027	J	0.020		1670		3.2		< 0.002	U	51700				< 0.008	U				
MW-S40-2	20 Oct 2018	T	N	0.025	J	0.022		1780		3.2		< 0.002	U	53900		95		< 0.008	U	**684**		1.10	
MW-S40-2	20 Oct 2018	T	FD	0.020	J	0.022		1730		3.1		< 0.002	U	52300		91		< 0.008	U	**695**		1.33	
MW-S40-3	19 Oct 2018	D	N	0.011	J	0.012		1050		0.7	J	< 0.002	U	8660				**0.024**					
MW-S40-3	19 Oct 2018	T	N	0.009	J	0.014		1150		0.7	J	< 0.002	U	10300		11.6		< 0.02	U	186		0.29	J
Deep Wells - SPNL Area																							
MW-SPNL-1	22 Oct 2018	D	N	0.019		0.022		1460		8.7		< 0.02	U	21100				< 0.2	U				
MW-SPNL-1	22 Oct 2018	T	N	0.018		0.021		1430		8.2		< 0.002	U	20100		30.6		< 0.02	U	312		0.39	J
MW-SPNL-3	22 Oct 2018	D	N	< 0.004	U	0.006	J	1640		5.0		< 0.002	U	30600				**0.062**					
MW-SPNL-3	22 Oct 2018	T	N	< 0.004	U	0.010	J	1580		4.7		< 0.002	U	30000		30.4		**0.059**		238		1.75	
QC Data - Blanks																							
Field Blank	22 Oct 2018	D	FB	< 0.004	U	< 0.004	U	< 60	U	< 0.2	U	< 0.002	U	< 20	U			< 0.008	U				
Field Blank	22 Oct 2018	T	FB	< 0.004	U	< 0.004	U	< 60	U	< 0.2	U	< 0.002	U	< 20	U	0.06	J	< 0.008	U	< 5.0	U	< 0.07	U

Table 3.2-1: Groundwater Sampling Results – Analytical Results

			Analyte	Total Suspended Solids		Uranium		Vanadium		Zinc		Radioactivity (gross alpha)		Radioactivity (gross beta)		Radium-226		Radium-228	
			CAS #	TSS		7440-61-1		7440-62-2		7440-66-6		12587-46-1		12587-47-2		13982-63-3		15262-20-1	
			Analysis Method	SM2540D		SW6020		SW6010C		SW6010C		E900		E900		E903.1		E904.0	
			Units	mg/l		µg/L		µg/L		µg/L		pci/l		pci/l		pci/l		pci/l	
			Human Health Ground Water Screening Level [1]	N/A		6		8.6		600		15		4		5		5	
			Maximum Contaminant Level (MCL) [2]	N/A		30		N/A		5000 (Secondary)		15		4		5		5	
Location	Sample Date	Fraction	Sample Type	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
Deep Wells - East Limb Area																			
EL-01	29 Aug 2018	D	N			0.730		0.6	J	< 0.4	U	< 2.2	U	3.2		0.11		0.18	
EL-01	29 Aug 2018	T	N	12.5		0.792		< 0.5	U	< 4.2	U	< 1.7	U	2.8		0.19		0.09	
MW-EL-02	18 Oct 2018	D	N			0.044		4.2		< 0.4	U	< 4.3	J	**10**	J	1.63		0.99	
MW-EL-02	18 Oct 2018	T	N	37.0		0.372		4.2		1.4	J	< 5.3	U	**8.2**	J	2.13		1.06	J
MW-EL-03	17 Oct 2018	D	N			3.77		0.8	J	3.0	J	7.3		2.7		3.18		1.13	
MW-EL-03	17 Oct 2018	T	N	< 5.0	U	3.62		0.7	J	3.4	J	5.7		3.8		2.68		1.03	
Deep Wells - South 40 Area																			
MW-S40-1	20 Oct 2018	D	N			5.05		1.1	J	15.6		11.2		**4.4**		0.53		< 0.93	U
MW-S40-1	20 Oct 2018	T	N	< 5.0	U	4.61		0.7	J	13.1		7.5		**4.2**		0.66		< 1.07	U
MW-S40-2	20 Oct 2018	D	N			2.28		1.8	J	1.1	J	5.6		**4.4**		0.74		< 0.96	U
MW-S40-2	20 Oct 2018	D	FD			2.25		1.6	J	1.5	J	5.9		3.8		1.03		< 0.95	U
MW-S40-2	20 Oct 2018	T	N	< 5.0	U	2.25		1.9	J	1.4	J	3.3		3.5		1.01		< 1.12	U
MW-S40-2	20 Oct 2018	T	FD	< 5.0	U	2.29		1.7	J	1.7	J	5		**4.7**		0.82		< 0.9	U
MW-S40-3	19 Oct 2018	D	N			2.18		< 0.5	U	0.5	J	3.5		3.1		0.53		< 1.26	U
MW-S40-3	19 Oct 2018	T	N	< 5.0	U	1.79		< 0.5	U	0.9	J	3.7		3.2		0.51		< 1.15	U
Deep Wells - SPNL Area																			
MW-SPNL-1	22 Oct 2018	D	N			1.50		4.5		1.2	J	2.8		3.2		0.64		< 0.93	U
MW-SPNL-1	22 Oct 2018	T	N	< 5.0	U	1.52		3.8	J	1.1	J	< 1.9	U	1.81		0.45		< 0.85	U
MW-SPNL-3	22 Oct 2018	D	N			3.57		1.1	J	< 4.2	U	N/S		N/S		N/S		N/S	
MW-SPNL-3	22 Oct 2018	T	N	< 5.0	U	3.75		0.9	J	< 4.2	U	4.5		3.5		0.31		< 0.9	U
QC Data - Blanks																			
Field Blank	22 Oct 2018	D	FB			< 0.005	U	< 0.5	U	0.6	J	< 1.28	U	< 1.59	U	< 0.186	U	< 1	U
Field Blank	22 Oct 2018	T	FB	< 5.0	U	< 0.005	U	< 0.5	U	0.9	J	< 1.09	U	< 1.58	U	< 0.194	U	< 1.01	U

Notes:

Value is above human heal h screening level

1. Human health ground water screening levels
2. Maximum Contaminant Level (MCL) provided for reference only

< - Result is not detected above the method detection limit (MDL)
D - Dissolved Fraction
FB - Field Blank
FD - Field Duplicate
J - Result is estimated
J- - Result is estimated with a low bias
J+ - Result is estimated with a high bias
mg/l - milligram per liter
N - Normal Environmental Sample
N/A - No Screening level available
N/S - Sample not collected
pci/l - picocuries per liter
S40 - Sou h 40
T -Total Fraction
U - Result is not detected above the MDL
µg/L - microgram per liter
UJ - Result is estimated and not detected above the MDL

Table 3.2-2: Groundwater Sampling Results – Field Parameters

			Conductivity	Dissolved Oxygen	Oxidation-Reduction Potential	pH	Temperature	Turbidity
		Units	µS/cm	mg/l	millivolts	pH units	˚C	ntu
		Ecological Screening Level	400	N/A	N/A	6.5 - 9	N/A	N/A
		Human Health Screening Level	N/A	N/A	N/A	5 - 9	N/A	N/A
Location	**Location Description**	**Sample Date**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
EL-1	East Limb Area	29 August 2018	**597**	2.87	-62.0	7.59	11.4	12.2
EL-2	East Limb Area	18 October 2018	**2279**	7.27	172.0	**12.25**	9.2	2.36
EL-3	East Limb Area	17 October 2018	**847**	0.61	-99.9	7.28	10.3	1.41
S40-1	South 40 Area	20 October 2018	**858**	0.60	34.7	7.09	9.7	1.34
S40-2	South 40 Area	20 October 2018	**794**	13.48	240.1	7.27	8.9	1.64
S40-3	South 40 Area	19 October 2018	257	0.74	212.3	8.24	10.7	1.65
SPNL-1	Headquarters Area	22 October 2018	368	1.87	185.5	8.03	11.5	0.99
SPNL-3	Headquarters Area	22 October 2018	370	0.81	241.0	8.03	11.7	1.70

Notes:

5.9	Value is above the Human Health screening level
335	Value is above the Ecological screening level (or below the lower range for pH)
335	Value is above both screening levels

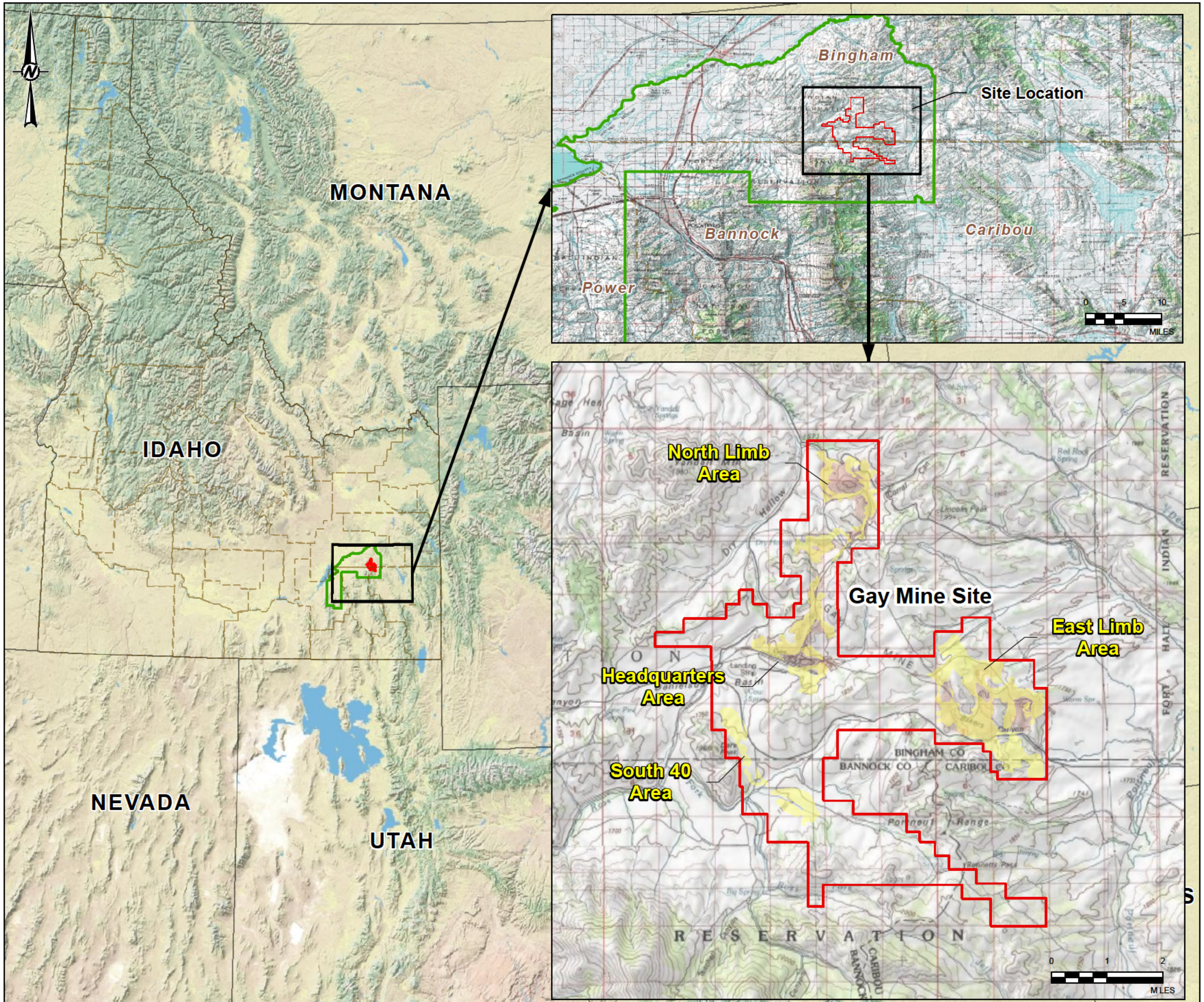
1. Ecological and human health screening levels, minimum of sources previously presented

mg/l - milligram per liter

ntu - nephelometric turbidity unit

µS/cm - microSiemens per centimeter

Figures



LEGEND

- CERCLA SITE BOUNDARY
- FORT HALL RESERVATION
- GAY MINE RECLAMATION AREAS
- STATE BOUNDARY
- COUNTY BOUNDARY

DRAFT

0 100 200
MILES

NOTE(S)

1. THIS FIGURE WAS ORIGINALLY PRODUCED IN COLOR. REPRODUCTION IN BLACK AND WHITE OR COLOR SCHEME OTHER THAN ORIG NAL FIGURE MAY RESULT N LOSS OF NFORMATION.
2. USED THE GAY MINE 1994 RECLAMATION STATUS MAP FOR THE OUTL NE OF PITS, MILL SHALE PILES AND OVERBURDEN RECLAMATION AS OF 1994. OUTLINES OF THESE FEATURES WERE MODIFIED US NG GOOGLE EARTH MAGES AND HISTORICAL AERIAL PHOTOS FROM USGS.

REFERENCE(S)

1. U.S. BUREAU OF NDIAN AFFAIRS (EMI C310.1.2. R2, 1-30-03, CERCLA SITE BOUNDARY)
2. COORD NATE SYSTEM: NAD 1983 STATEPLANE IDAHO EAST FIPS 1101 FEET, DATUM: NORTH AMERICAN 1983
3. SERVICE LAYER CREDITS: COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED COPYRIGHT: © 2013 NATIONAL GEOGRAPHIC SOCIETY

CL ENT
FMC CORPORATION/J.R.SIMPLOT COMPANY

PROJECT
2018 DATA SUMMARY REPORT

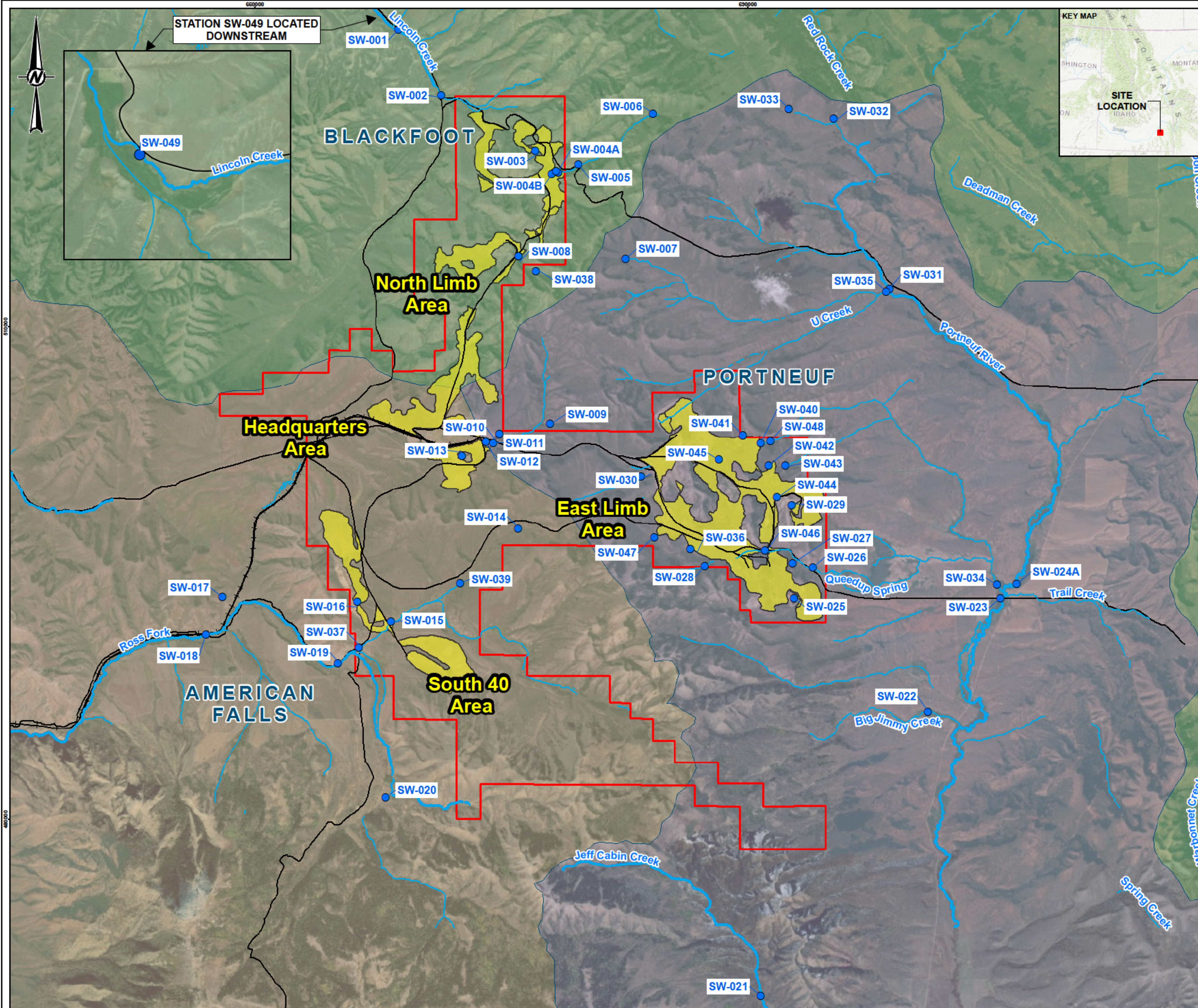
TITLE
SITE LOCATION

CONSULTANT

GOLDER

YYYY-MM-DD	2019-02-19
DESIGNED	-
PREPARED	HJ
REVIEWED	JC
APPROVED	####

PROJECT NO.	PHASE	REV.	FIGURE
1039341816	003	A	1.1-1



LEGEND
- SURFACE WATER SAMPLE LOCATION
- MAJOR STREAM/RIVER
- MINOR / PERENNIAL WATERWAY
- RAILROAD
- ROAD
- CERCLA SITE BOUNDARY
- 1994 RECLAMATION AREA OR IN-PIT OVERBURDEN

HYDROLOGIC UNIT BOUNDARY & BASIN NAME
- 17040206 - AMERICAN FALLS
- 17040207 - BLACKFOOT
- 17040208 - PORTNEUF

DRAFT

0 6,000 12,000 FEET
1 NCH = 6,000 FEET

NOTE(S)
1. THIS FIGURE WAS ORIGINALLY PRODUCED IN COLOR. REPRODUCTION IN BLACK AND WHITE OR COLOR SCHEME OTHER THAN ORIG NAL FIGURE MAY RESULT N LOSS OF NFORMATION.
2. USED THE GAY MINE 1994 RECLAMATION STATUS MAP FOR THE OUTL NE OF PITS, MILL SHALE PILES AND OVERBURDEN RECLAMATION AS OF 1994. OUTLINES OF THESE FEATURES WERE MODIFIED US NG GOOGLE EARTH MAGES AND HISTORICAL AERIAL PHOTOS FROM USGS.

REFERENCE(S)
1. GOLDER (SAMPLE LOCATIONS, ROADS)
2. USGS (NHD STREAMS, RAILROADS)
3. U.S. BUREAU OF NDIAN AFFAIRS (CERCLA SITE BOUNDARY)
4. S MPLOT (PITS AND RECLAMATION AREAS)
5. COORD NATE SYSTEM: NAD 1983 STATE PLANE IDAHO EAST (FT)
6. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, DELORME, NTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTR BUTORS, AND THE GIS USER COMMUNITY
SOURCES: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGR D, IGN, AND THE GIS USER COMMUNITY

CL ENT
FMC CORPORATION/J.R.SIMPLOT COMPANY

PROJECT
2018 DATA SUMMARY REPORT

TITLE
2018 SURFACE WATER SAMPLING LOCATIONS

CONSULTANT
GOLDER

YYYY-MM-DD	2019-02-19
DESIGNED	JC/BVJ
PREPARED	HJ
REVIEWED	JC
APPROVED	-

PROJECT NO.	PHASE	REV.	FIGURE
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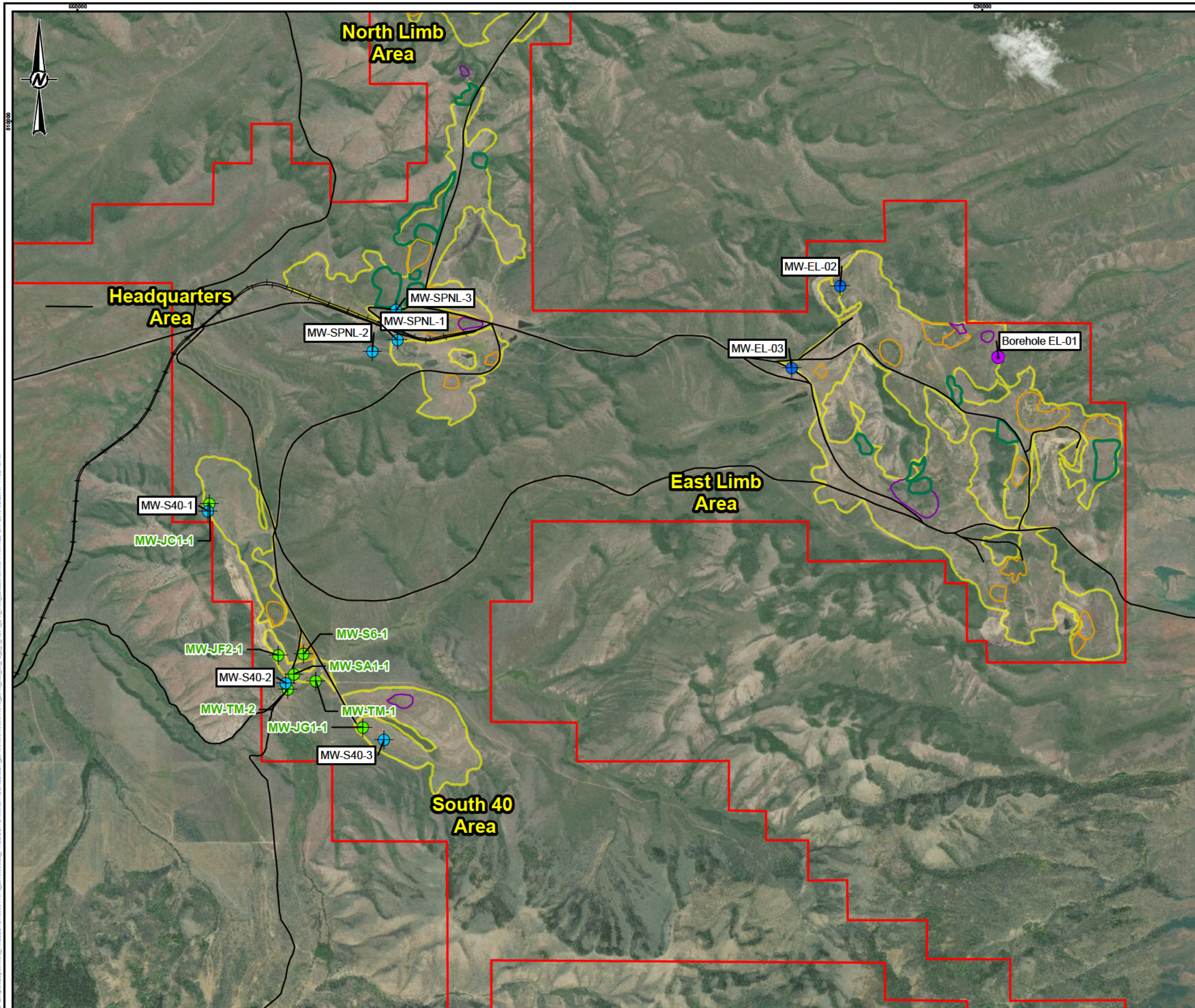


LEGEND

WELLS FORMATION MONTIORING WELLS

- INSTALLED IN 2018
- INSTALLED IN 2016 AND 2017

BOREHOLE ONLY (NO WELL INSTALLED)

- DRILLED (AND ABANDONED) IN 2018

SHALLOW (PERCHED GW) MONTIORING WELLS

- INSTALLED IN 2015
- RAILROAD
- ROAD
- CERCLA SITE BOUNDARY
- 1994 RECLAMATION AREA OR IN-PIT OVERBURDEN

MILL SHALE PILES (AS OF 1993)

- NO TOP SOIL OR RESEEDING
- PARTIAL TOP SOIL AND/OR RESEEDING
- TOP SOIL ADDED AND/OR RESEEDING

DRAFT

0 1,600 3,200 FEET

1 NCH = 3,257 FEET

NOTE(S)

1. BOREHOLE EL-01 LOCATION IS EST MATED.
2. THIS FIGURE WAS ORIGINALLY PRODUCED IN COLOR. REPRODUCTION IN BLACK AND WHITE OR COLOR SCHEME OTHER THAN ORIG NAL FIGURE MAY RESULT N LOSS OF NFORMATION.
3. USED THE GAY MINE 1994 RECLAMATION STATUS MAP FOR THE OUTLINE OF PITS, MILL SHALE P LES AND OVERBURDEN RECLAMATION AS OF 1994. OUTLINES OF THESE FEATURES WERE MODIFIED US NG GOOGLE EARTH MAGES AND HISTORICAL AERIAL PHOTOS FROM

REFERENCE(S)

1. GOLDER (WELLS, ROADS)
2. U.S. BUREAU OF NDIAN AFFAIRS (CERCLA SITE BOUNDARY)
3. S MPLOT (PITS AND RECLAMATION AREAS)
4. COORD NATE SYSTEM: NAD 1983 STATE PLANE DAHO EAST (FT)
5. SERVICE LAYER CREDITS: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/A RBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY

CLIENT
FMC CORPORATION/J.R.SIMPLOT COMPANY

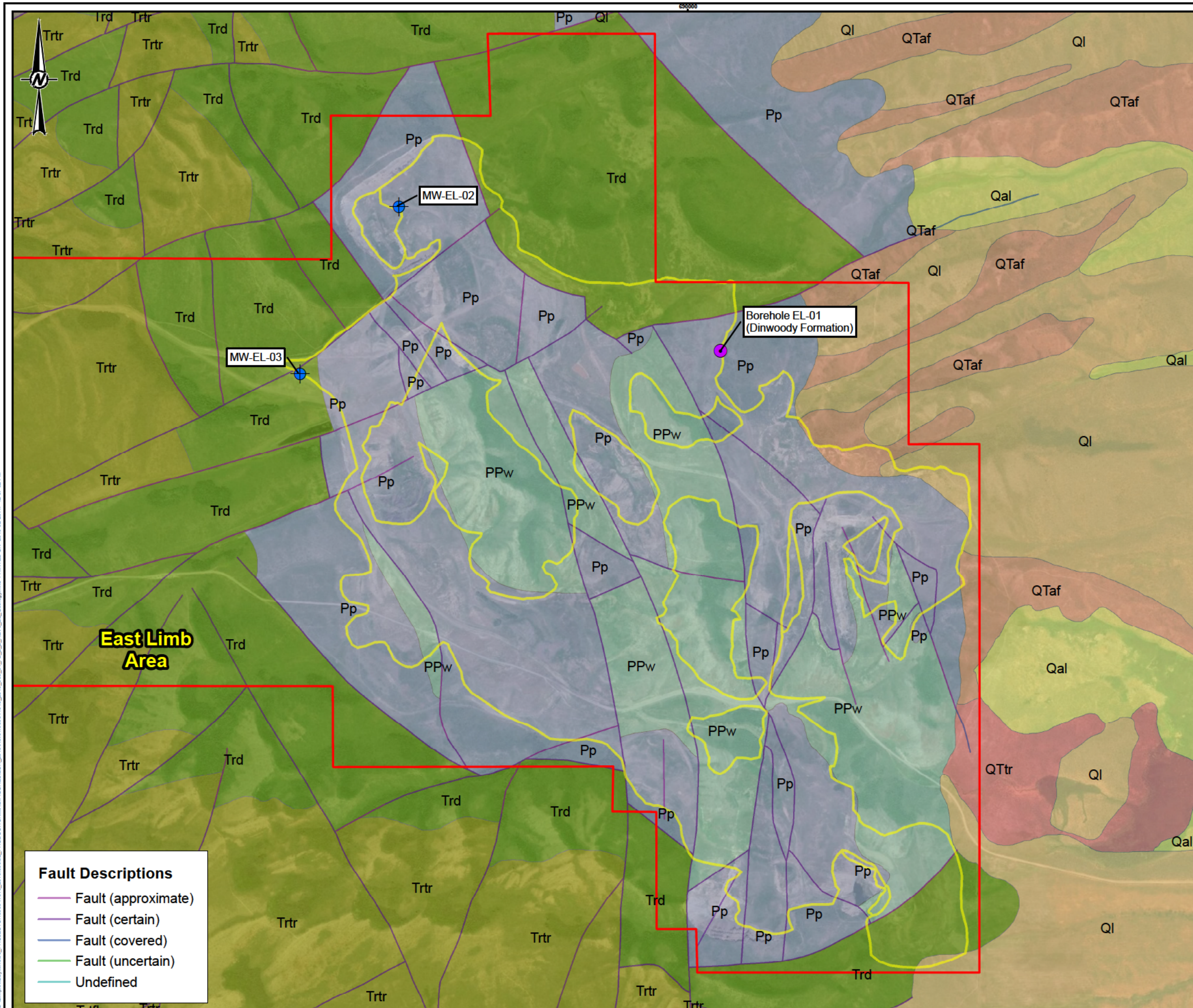
PROJECT
2018 DATA SUMMARY REPORT

TITLE
GROUNDWATER MONITORING WELL LOCATIONS

CONSULTANT
GOLDER

YYYY-MM-DD	2019-02-26
DESIGNED	JC/BVJ
PREPARED	HJ
REV EWED	JC
APPROVED	JP

PROJECT NO.	PHASE	REV.	FIGURE
1039341816	003	0	2.2-1



LEGEND

- MONTORING WELL (WELLS FORMATION)
- BOREHOLE DRILLED AND ABANDONED IN 2018

GEOLOGIC UNITS

- Qal - Alluvium (Holocene)
- Ql - Loess (Holocene and Pleistocene)
- QTaf - Older fan deposits
- QTtr - Travertine
- Trd - Dinwoody formation
- Trtfh - Fort Hall Member
- Trtr - Ross Fork Limestone Member
- Pp - Phosphoria formation, undifferentiated
- PPw - Wells formation, undifferentiated
- CERCLA SITE BOUNDARY
- 1994 RECLAMATION AREA OR IN-PIT OVERBURDEN

DRAFT

0 1,600 3,200

1 NCH = 1,600 FEET FEET

NOTE(S)

1. THIS FIGURE WAS ORIGINALLY PRODUCED IN COLOR. REPRODUCTION IN BLACK AND WHITE OR COLOR SCHEME OTHER THAN ORIG NAL FIGURE MAY RESULT N LOSS OF NFORMATION.
2. USED THE GAY MINE 1994 RECLAMATION STATUS MAP FOR THE OUTLINE OF PITS, MILL SHALE P LES AND OVERBURDEN RECLAMATION AS OF 1994. OUTLINES OF THESE FEATURES WERE MODIFIED US NG GOOGLE EARTH MAGES AND HISTORICAL AERIAL PHOTOS FROM USGS.

REFERENCE(S)

1. HLADKY ET AL. (1992) (GEOLOGY
3. U.S. BUREAU OF NDIAN AFFAIRS (CERCLA SITE BOUNDARY)
4. S MPLOT (PITS AND RECLAMATION AREAS)
5. COORD NATE SYSTEM: NAD 1983 STATE PLANE DAHO EAST (FT)
6. SERVICE LAYER CREDITS: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/A RBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY

CLIENT
FMC CORPORATION/J.R.SIMPLOT COMPANY

PROJECT
2018 DATA SUMMARY REPORT

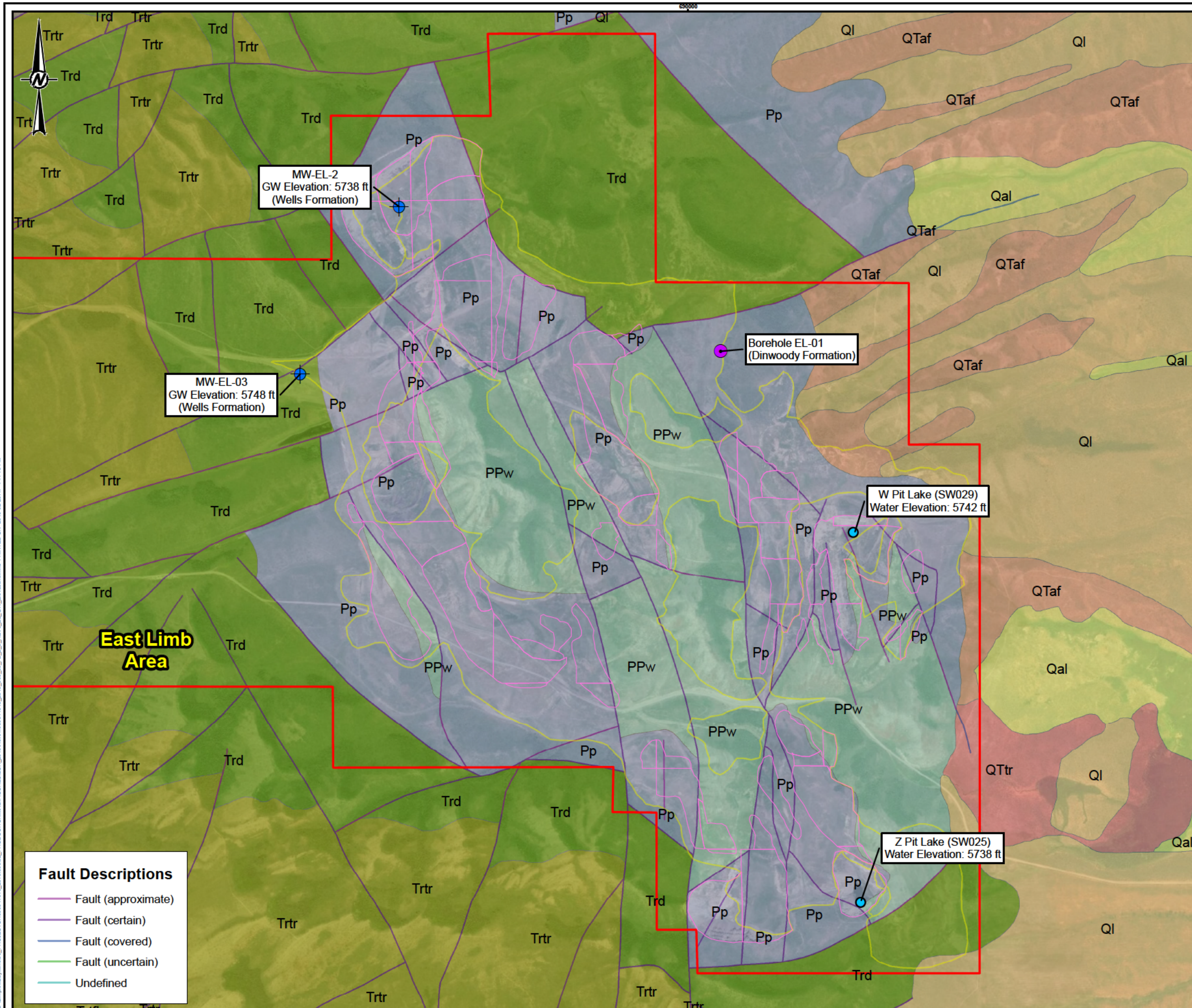
TITLE
EAST LIMB GEOLOGY

CONSULTANT

GOLDER

YYYY-MM-DD	2019-02-26
DESIGNED	JC/BVJ
PREPARED	HJ
REV EWED	JC
APPROVED	JP

PROJECT NO.	PHASE	REV.	FIGURE
1039341816	003	0	2.2-2



LEGEND

- MONTORING WELL (WELLS FORMATION)
- BOREHOLE DRILLED AND ABANDONED IN 2018
- PIT LAKE
- PIT LOCATIONS
- CERCLA SITE BOUNDARY
- 1994 RECLAMATION AREA OR IN-PIT OVERBURDEN

Geologic Units

- Qal - Alluvium (Holocene)
- Ql - Loess (Holocene and Pleistocene)
- QTaf - Older fan deposits
- QTtr - Travertine
- Trd - Dinwoody formation
- Trtfh - Fort Hall Member
- Trtr - Ross Fork Limestone Member
- Pp - Phosphoria formation, undifferentiated
- PPw - Wells formation, undifferentiated

DRAFT

0 1,600 3,200

1 NCH = 1,600 FEET FEET

NOTE(S)

1. MONITORING WELL AND PIT LAKE ELEVATIONS ARE SURVEYED TO NAVD88.
2. THIS FIGURE WAS ORIGINALLY PRODUCED IN COLOR. REPRODUCTION IN BLACK AND WHITE OR COLOR SCHEME OTHER THAN ORIG NAL FIGURE MAY RESULT N LOSS OF NFORMATION.
3. USED THE GAY MINE 1994 RECLAMATION STATUS MAP FOR THE OUTLINE OF PITS, MILL SHALE P LES AND OVERBURDEN RECLAMATION AS OF 1994. OUTLINES OF THESE FEATURES WERE MODIFIED US NG GOOGLE EARTH MAGES AND HISTORICAL AERIAL PHOTOS FROM USGS.

REFERENCE(S)

1. A&E ENGINEERING (WELLS, 9/14/18)
2. U.S. BUREAU OF INDIAN AFFA RS (CERCLA SITE BOUNDARY)
3. SIMPLOT (PITS AND RECLAMATION AREAS)
4. COORDINATE SYSTEM: NAD 1983 STATE PLANE IDAHO EAST (FT)
5. SERVICE LAYER CREDITS: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPP NG, AEROGR D, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY

CLIENT
FMC CORPORATION/J.R.SIMPLOT COMPANY

PROJECT
2018 DATA SUMMARY REPORT

TITLE
EAST LIMB GROUNDWATER AND PIT LAKE ELEVATIONS

CONSULTANT
GOLDER

YYYY-MM-DD	2019-02-26
DESIGNED	JC/BVJ
PREPARED	HJ
REV EWED	JC
APPROVED	JP

PROJECT NO.	PHASE	REV.	FIGURE
1039341816	003	0	2.2-3

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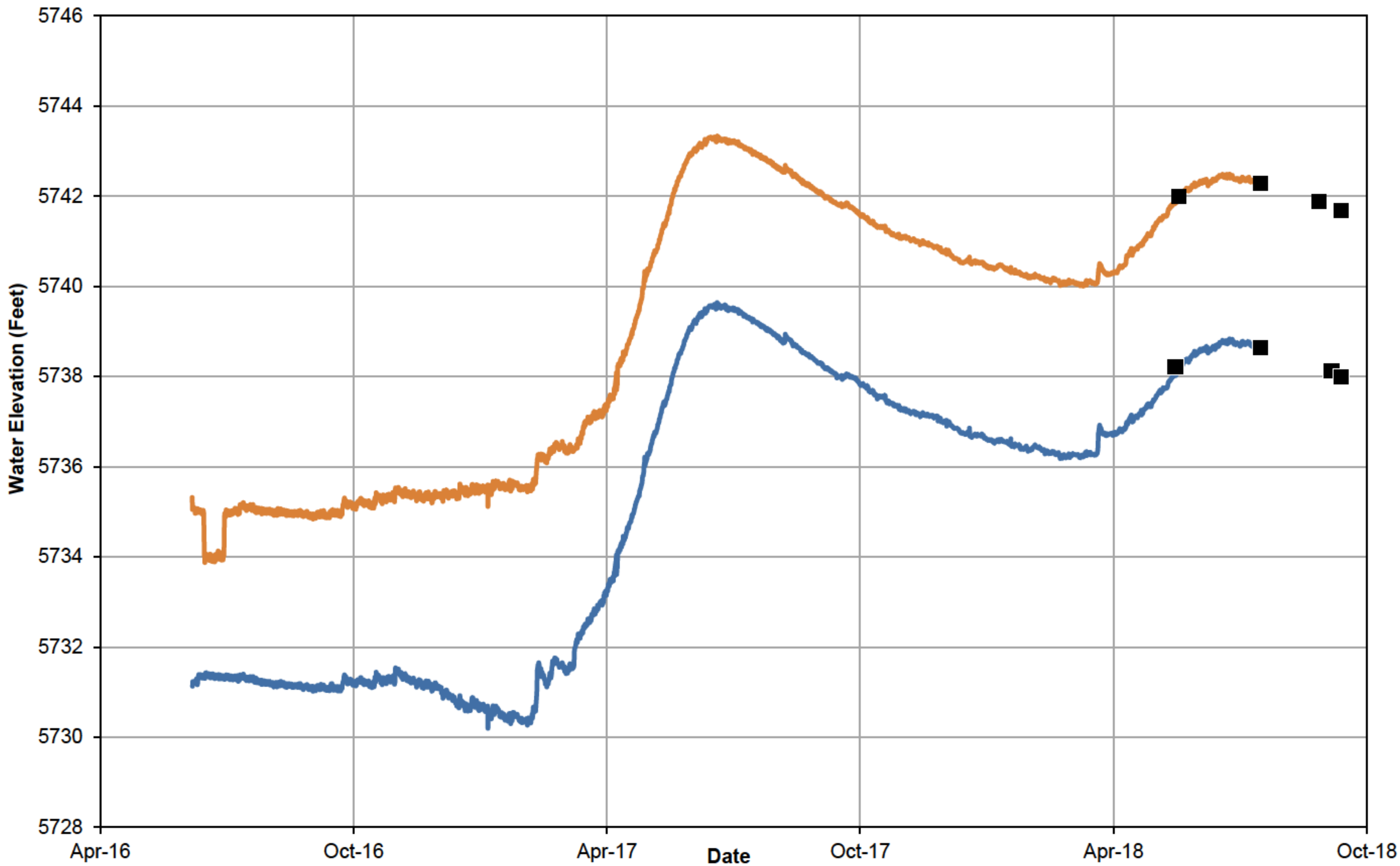


LEGEND

W Pit Transducer
Z Pit Transducer
Manual (from Staff Gauge Reading/Survey)

CLIENT
FMC CORPORATION/J.R. SIMPLOT COMPANY

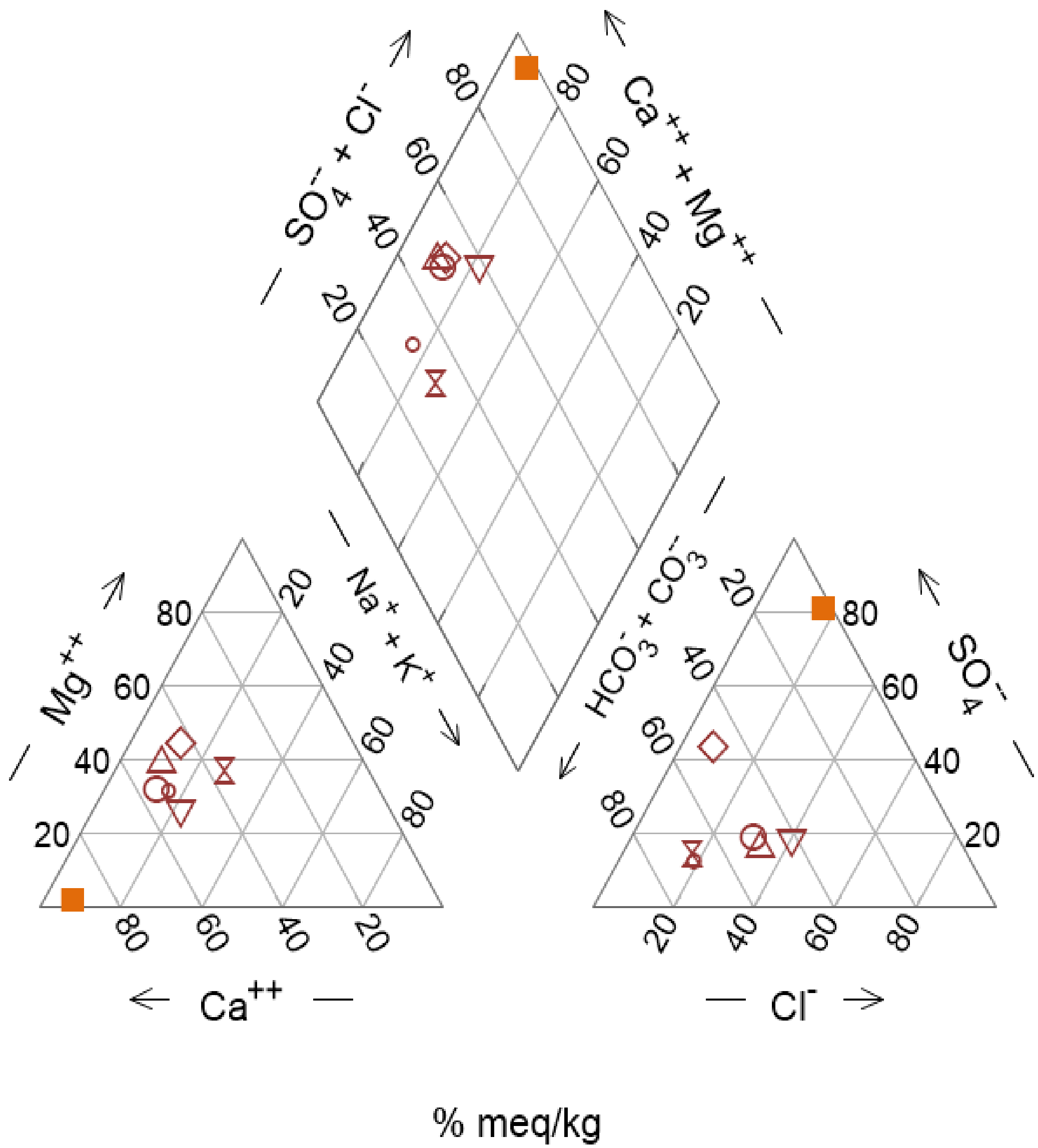
CONSULTANT
GOLDER

PROJECT
2018 DATA SUMMARY REPORT

TITLE
Z PIT LAKE AND W PIT LAKE HYDROGRAPHS

PROJECT NO.	PHASE	REV.	FIGURE
1039341816	003	A	2.2-4

PATH (b) (6)



LEGEND

- MW-EL–02
- MW-EL–03
- MW-S40–1
- MW-S40–2
- MW-S40–3
- MW-SPNL–1
- MW-SPNL–3

CLIENT
FMC CORPORATION/J.R. SIMPLOT COMPANY

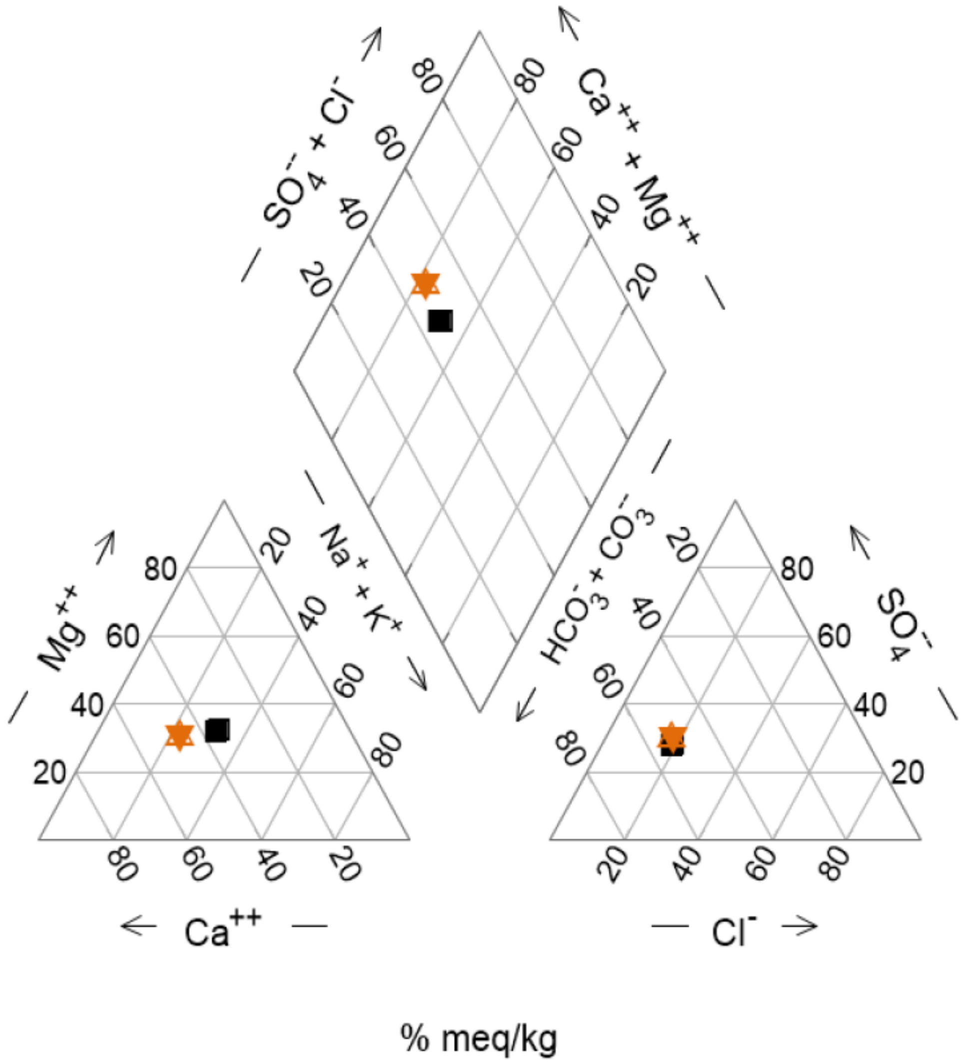
CONSULTANT
GOLDER

PROJECT
2018 DATA SUMMARY REPORT

TITLE
PIPER DIAGRAM OF 2018 GROUNDWATER SAMPLES

PROJECT NO.	PHASE	REV.	FIGURE
1039341816	003	A	3.2-1

PATH (b) (6)



LEGEND

- ■ EL–1 Total
- □ EL–1 Dissolved
- ▼ SW040 Total
- △ SW040 Dissolved

CLIENT
FMC CORPORATION/J.R. SIMPLOT COMPANY

PROJECT
2018 DATA SUMMARY REPORT

CONSULTANT
GOLDER

TITLE
PIPER DIAGRAM OF BOREHOLE EL-01 AND SW-040 WATER QUALITY

PROJECT NO.	PHASE	REV.	FIGURE
1039341816	003	A	3.2-2